1972

GERIATRICS

The Essentials of the Geriatric Examination at 50*

C. Ward Crampton, M.D.†

DEFINITION

THE GERIATRIC examination is a medical examination made by a physician. It has to do with age and aging. It can be given appropriately at any age during life, from minus nine months to 90 years and over although popular and medical interest are most readily attracted to the time area around 40 or 50, when damages and deteriorations accumulate and begin to obtrude themselves with increasing insistence.

VALUE

IT WILL take fifty years to get the exact figures, but I believe that if 100,000 American men at the age of 50 were to get a good geriatric examination, follow it up with good geriatric anti-aging service, they would live, on the average, 10 to 20 years longer than their heedless or less fortunate compeers and have twice the joy of life with half the pain.

We seem to have done it with white rats. If our yearly increasing records mean what they seem to mean to those who have had their examinations and are getting this service we may be on our way to doing it with men. When the weak become strong, when fatigue and frustration give way to purposeful activity, when stagnant body functions take on renewed vigor—then the anti-aging, de-aging services of geriatrics merit increased medical attention. The awakened public demand must meet with skilled and experienced service. Accordingly, let us examine the simple essentials and distinctive features of the geriatric examination and geriatric service.

*Read at the sixth annual meeting of the American Geriatrics Society, Atlantic City, N. J., 1949.

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THE GERIATRIC EXAMINATION

Inasmuch as the geriatric examination concerns itself with everything that has to do with aging and its prevention, it can be done on the sick or the well and, as we have said, at any age. It is the health examination with an added purpose, longevity de luxe.

C. WARD CRAMPTON, M.D.

The examination includes the whole man—his whole life, past, present, and to come. It is therefore *holistic*. It is far more than the routine disease examination, which it includes.

If a busy physician examines a man looking only for disease, finds none, and reports, "There is nothing wrong," he has done a service. Yet if he says there is nothing that medicine can do for him he is in error. In the 1932 edition of "Preventive Medicine," published by the Academy of Medicine, we state, "We have studied diseases but not lives. We need life-time diagnosis. We need life-time management. We shall then get life-time results."

FORMS OF THE GERIATRIC EXAMINATION

THERE are two quite different forms of the geriatric examination, corresponding to two quite different purposes: the first is for research; the second has a clinical and hygienic purpose.

The *research examination* may be holistic or confined to one organ, one food, one chemical substance, or one procedure. It seeks information and makes record. It is not its purpose to give service to the examinee, although its findings may be so applied soon or late. A typical form of geriatric research examination is being developed in which it is proposed to examine 100,000 men at the age of 50, and repeat the examination year after year for 20, 30, 40 years, or a lifetime. It is longitudinal. When this is done we shall have data on the causes, beginnings, and progress of chronic illness *which we can get in no other way*. We shall also know much more about aging in all of its ways and forms than we do now. At present single item "vertical" research is the most popular intensive form of effort and is making excellent progress. The holistic form of research of coordination, i.e., the synthesis of specialized data collected from different parts of life and living, is in need of development. Much more can be said on the research geriatric examination, but we shall now turn to a very different matter—*the clinical and hygienic examination*, for personal service.

IN ONE sense a clinical situation is never a research situation. In a broader sense, every clinical situation is a research challenge, far more difficult and complex than ordinary, intensive unipolar research with only one unknown quantity in the equation. The clinical examination, with its life management purpose, has numberless, unknown quantities.

The examiner does not ask only, "What disease has this man and how can I cure it?" He asks, "What can I, as a physician, do for this man? How can I find and cure his illnesses, past, present, and to come? How can I extend his years and fill them with health, strength, and satisfaction?" Geriatric service seeks to cure, support, protect, and ameliorate. It also endeavors to postpone, minimize, and prevent degenerations related to age and aging. Age fighting is the central purpose and distinctive feature.

DEFINITION AND CLASSIFICATIONS OF AGE

SINCE we are dealing with age, it would be wise to define age as best we may. The following classification has been suggested:

What is age? There are seven kinds of age, of which four are biological: anatomical age, physiological age, psychological age, and pathological age. Three are ages of record: chronological age, statistical age, and hereditary age. The geriatric examination regards them all.

Chronological age:

This is age in years. A man of 60 is 60 years old, plus nine months. These nine months before birth are by far the most important of all life, for they determine so much of its quality as well as its length. We shall call upon the obstetrician, the geneticist, and all other specialists in the science of life to give us further information and guidance on what we, as geriatricians, can do in these nine months.

But a man of 60 is not only 60 years and nine months old, he is over 60,000,000 years old. In conducting a geriatric examination, we must go back and remember not only the preceding life of the man, but the life of the race, and the preceding stages of life development which started with the First Cause and has proceeded through the ages to produce the first atom, the first molecule, the first living cell, the first vertebrate and the man we examine.

THIS introduces our study of the immediate ancestry. There is nothing that can be found in the man that has not been foreshadowed in the lives which produced him. The apple does not fall far from the tree. And it is an apple tree, none other. It is a great advantage to examine as many as possible of one family—brothers, sisters, parents, and others. Of course we are familiar with the occurrence of illness of later life—cardiac disease, hypertension, and diabetes in successive generations—but there is much more to know and use to the advantage of any one branch of the family tree. There is an additional advantage to be gained by the examination of the wives, husbands, siblings, and children.

The geriatric examination of the person is not complete until we have examined his living conditions. If one member of the family has a headache,

*C. Ward Crampton, M.D.: What geriatrics means to the physician, New York Med. 3:10, 1947.

all other members may suffer; and a painful chronic colitis in one may cause high blood pressure or angina in another. The family is not only an organization, it is a living organism. Much work has been done in this field by Dr. H. E. Meleney, of New York University. This illustrates the importance of the integration of social and psychological services as part of the geriatric examination and program. Chronological age, however, is circumstanced by aging in the fields of anatomy, physiology, psychology, and pathology.

Anatomical age:

Anatomical age is shown in the body cells, in drying, hardening, shrinking, collection of more or less inert material, changes in permeability of cell membrane, and so forth.

During life, structures appear, grow and mature, decline and atrophy. These successive anatomical stages can be seen in cells, tissues and organs. These changes proceed at different rates in different persons and in different parts of the body. Therefore anatomical ages differ in different persons and in different organs.

IN THIS connection we need to give more attention to the effect of gravity upon the man. Year by year, through advancing life, gravity is continually pulling him down, dragging upon organ after organ, upon the shoulders, neck, chest, and head, until finally he is dragged down again to his mother, earth, for his final rest. It has taken man eons to rise to the erect position and it takes only a lifetime to lose it.

In recording anatomical aging, we note the comparative size of the chest and abdomen. The chest should be measured at minimum and maximum, the abdomen contracted and relaxed. After babyhood the chest measurements should exceed the abdomen measurements by 10 per cent. Every inch the abdomen exceeds the chest carries a penalty. If the chest cavity is decreased, the heart is ptosed and crowded, the aspiration of the thorax diminished, blood and lymph lag in their upward movement to the heart. Stagnation results and stagnation causes deterioration and damage, commonly ascribed to aging. This postural stagnation must be recognized. It can be fought, prevented, and to a great extent overcome.

OTHER anatomical records in this field are made by dropping a plumb line in front—it should touch the chest but not the abdomen. Dropped at the back, neither the neck nor the lumbar spine should be away from it much more than an inch or two. Anatomical aging is seen in the arcus senilis in the eye, the hardness of the veins and arteries. We must obtain some convenient way of recording the hardness of arteries in addition to palpation. A comparison of the time of the pulse beat at the carotid with the time of the beat at the radial, or dorsalis pedis artery, is suggested as a measurement of the speed of the pulse wave, which increases in rapidity with the progress of arterial hardness.

We should like some convenient method of recording the elasticity of

the skin, possibly by graduated tension calipers. This is a sign of great possible significance and usefulness in life management, and may guide our use of certain vitamins and certain amino acids, now under promising experiment.

The knobbing of the ribs at the costo-chrondral junction is historic, pointing back to youth; diagnostic, indicating present status; prophetic and helpful in nutritional management.

The number of teeth that a man has lost is equally historic, diagnostic, and guiding. These, and many other signs of anatomical age, all have their counterparts in physiological aging. Every body part has many messages to the examiner. When he examines the eye, tongue, skin, heart, or any other region or function, he is examining (1) the nervous system, (2) nutrition, (3) the circulation, (4) the endocrine service, and, to a great extent, the psyche. He cannot examine one without regarding all. This is holism, basic to medical service to the aged and aging. It is basic to completeness in all medical examinations and all medical treatment.

Physiological age:

Every function of the body changes, and, most commonly, declines, with age. There are three great areas of interest—the nervous system, the endocrine glands, and the circulatory system. All of these are circumstanced by nutrition in all its seven phases.

THE MEASUREMENT of physiological efficiency may be disregarded by the unwary physician who is merely in search of a diagnosis, but never by the geriatrician. He has two methods, one of which is ordinary testing of the various physiological efficiencies at the basal level, and the second is the "stress test," in which the organ, or system, is given a task to perform or a stress to overcome which is a challenge to its ability to meet the strains of life, illness, or age. The stress test may be called prophetic. Many stress tests are familiar to medicine, for example: the immersion of the wrist in ice water to observe the rise in blood pressure; the comparison of the blood pressure lying down with the blood pressure standing, to determine the circulatory efficiency of gravity resistance. (This was introduced by the author forty-five years ago, incorporated in the Schneider test, and has since been used widely, especially in military aviation.) We give the heart a measured amount of work to do, and note the changes in pulse, pressure, and the cardiogram. We give the kidney and liver and pancreas a chemical challenge, and note its efficiency, and perhaps gain some indication of its prospective endurance in the oncoming years. (In the State of Maine, it has been claimed that, if a man can jump over a barrel on his fiftieth birthday, he will live past seventy.) We can give 15 grains of carmine at dinner time and see how long it takes the digestive tract to clear itself. A reservoir which overflows daily and never empties itself often hides serious and damaging conditions. A patient with asthma for nine years had a bowel movement daily, but showed carmine for eight days. She was cured in 10 days with castor oil (and a very angry woman!).

Simple stress tests are easily used. They should be much further developed, and progress made in the direction of increasingly exact procedure and mathematical evaluation. And, of course, studies should be made to determine the relationship of the test recorded today with the condition of the organism 10, 20, and 30 years onward. The application of physiological testing to geriatrics is in its infancy.

Pathological age:

Throughout the years, man ages by damage more than by the mere passage of time.

The simplest and easiest part of the geriatric examination is that for signs of present disease. This is child's play compared with our endeavor to discover signs of illness to come. This task is commonly disregarded, evaded, and discredited, because it lacks the stinging incentive of present pain and besides it is too difficult. Maybe it cannot be done, yet it must be done, and we must do it. This is a challenge to statesmanship.

A SEVERE attack of influenza at 50 may age a man 10 years or more through damage to the adrenal glands and other body cells. Many other illnesses act in the same way. The man is older because of an acute pathological incident. Chronic focal infection in teeth, sinuses, gall bladder, prostate, cause aging from drain on resources and damages from toxicity. There is a great chance for service for the physician who must be given a chance. Ordinarily a man comes for medical care only when clinically sick or disabled or driven by pain. When he gets well he leaves medical care behind although he may have within his body one to two dozen aging pathological conditions, some of which may be discovered by diagnostic search and removed.

A man may age from pathological conditions caused by errors in life management discoverable by diagnostic life survey. These may be corrected if the man will cooperate. The use of cathartics, sedatives, tonics, vitamins and food fads are most common and often difficult to correct.

PREVENTION and discovery and removal of pathological aging is the heart of geriatrics. Where condition is poor or general aging is beyond warrant, the presence of infection can be surmised and verified by a rapid sedimentation test or the shift in the leucocyte count, and perhaps traced to its source or sources. But the condition can be attacked and sometimes apparently eliminated by general all over methods without further identification, with the most dramatic and happy results.

The pathological survey:

The study of chronic diseases must begin in the decades of life before their symptoms commonly arise. To do this, there should be established throughout the nation geriatric record and research and service stations, primarily to examine and record the status of individuals at the age of 50, 40, 30, and so on, year by year, for two, three, or four decades, as we have previously recommended.

In one respect, the geriatric method is leading notable advance in medical practice. The idea that the doctor can do nothing because a disease is incurable, or a deterioration irreversible, will be regarded in the future as a betrayal of the standards of the medical profession and of the interests of the patient. Faced with any incurable disease or any of the normal deterioration of aging, the physician works for three things: *alleviation, palliation* and *postponement.*

HIS METHOD is characteristically one of support. For example, if a heart condition is incurable, he will bring all the other organs, nutritional resources, and the hygiene program of the patient up to the highest efficiency. This gives the heart better services and less labor and also may remove one or more of the original and continuing causes of cardiac condition. This, in turn, gives the heart a chance to return to the organs longer and better service than before. The man is better, the heart is better. Many a man has become more active, more vigorous and happier after his first coronary attack by the use of this method. If one cannot restore the crippled organ, restore the man—he may "cure" his own heart.

This is typical of the direction of advance in geriatrics, because it applies to every organ and function. Much can be done for the weakened or diseased and otherwise hopeless kidney, liver, heart, pancreas, eye, joints, arteries, and the mind of the aging man, by this procedure. It is generally approved in principle and is being increasingly followed. Research is bringing out the fact that the illness of one organ is often due to failure of another, and this in turn the result of a cause still more occult. This points to the importance of a thorough all-over examination of the whole patient in the presence of any chronic illness and also in the presence of no apparent illness at all.

In ordinary medicine mono-diagnosis may be tolerated. In geriatrics, poly-diagnosis, with a thorough synthesis of interrelationships into a complete life pattern, is the way of progress and the essence of holism. Much more may be said on this subject. The "push-button principle" is commencing to be recognized in our medical schools. An electric bell may sound its symptoms at parts of the body far remote from the push-button which actuates it. The use of the "trigger points" and sphenopalatine ganglion treatment are examples.

Psychological age:

Every good physician realizes that the body has a mind and a mind has a body. They aid, support, age, damage, and restore each other, and each is at the mercy of the other. Yet each can be used to aid the other's salvation.

In geriatrics we must remember that we turn over the management of the man to the man himself. We must know his ability as a self-manager from his past record and current life routine report and we must help him develop this self service. It is more and more important to recognize that everything depends upon the endocrine glands and the autonomic nervous system. The "sympathetico-tonic," quick-pulsed extrovert must get the benefits of well-

directed, wise self-management as well as the far-sighted, conservative, slow-pulsed, introverted, low-blood pressured, good-humored "vago-tonic." These two kinds age differently. Their habits and minds, feelings and illnesses, in short, their whole lives are different. To this we must take heed.

In our geriatric examination we must find out all we can about the endocrine glands. We read their various weakness or strength, stability or instability in the eye, skin, speech, pulse, tongue, stature, action, history and record by test. They are the managing superintendents of the departments of the body-mind organization. We, as visiting examiners must know, respect, aid, and use them all.

In making our psychological exploration, we can use key questions which are calculated to give pilot information on the nature of the life as it is lived and life as it can be lived.

ESPECIALLY significant are likes, dislikes, and the attitude toward the future. The following questions have been found useful:

"There are some things that I enjoy doing—and I do very well, particularly ....."
"On the other hand I am not good at ....."
"The things that annoy me most in life are....."
"Ten years from now I would like to do ....."
"Ten years from now I would like to be ....."

The way the examinee answers these and other questions in his self-reported history reveals and guides.

In connection with psychological age, much information is to be gained by the evidence of structure, physiological status and test, voice, manner, action and reaction. When you greet a man and shake his hand, you have gathered more important data than you can classify in a half hour. This is supplemented by a patient hearing of the examinee's own story. Ancestral traits, geographical and anthropological, give their guidance. People from different parts of the world have different bodies, minds, cephalic indices, hands, feet, colons, thoughts, feelings, glands, perspectives, and digestions. Thus we explore the mind as we examine the body.

These, therefore, are the four biological ages: anatomical, physiological, psychological, and pathological. To these we add three ages of record—chronological, as already discussed, statistical, and hereditary—as follows:

Statistical age:

This term refers to man's "life expectancy," the average number of years he may expect to live. Since 1900 life expectancy of the child at birth has increased approximately ten times the life expectancy for the man of sixty.

Life expectancy varies with sex, occupation, residence, race, and medical care. Those who have health examinations live longer on the average than those who do not. Longer and better lives may be expected to result from more and better geriatric care.

Hereditary age:

This term may be used to modify the "statistical age" by the recognition of the fact that a long-life ancestry tends to make long-lived men. It is proposed that the ages of grandparents, father and mother, uncles, aunts, and grand-uncles and aunts of a certain individual be averaged and called the "hereditary age." If the person is living, the expectancy may be added to present age. This is frankly speculative and there are statistical hazards, but the man of sixty whose forebears averaged ninety-five at death is potentially a far different man from the man of sixty whose ancestors averaged forty-five years of age, and this fact should be noted in geriatrics. Where the hereditary age is markedly low, we must examine the ancestral tree, root and branch, for scientific guidance. To say, "Oh, yes, that is hereditary, we can do nothing," is to recall the day of dull and lazy ignorance.

Thus we have discussed the seven aspects of age, more clearly to define our purpose and guide the method of the geriatric examination. We may well turn our attention to the practical management of the examination itself.

THE EXAMINATION ITSELF

One of the commonest errors which defeats the purpose of the geriatric examination is to consider that when the examination is finished, the task is done, its purpose accomplished, and nothing else is necessary. This is a surprisingly common attitude and it is bad. The examination is nothing in itself. Its only purpose is to initiate and guide an age-fighting program which continues through the rest of life.

The examination is followed at once by efforts to remove pathological conditions, to correct all age-producing influences of a negative character, including defects, deficiencies and destructive errors in life management. On the positive side, it seeks to add advantages, privileges, and betterments to life through diet, medication, uplift and outlook, which will make life more vivid, serene, secure, long and strong. These purposes are distinctive, and determine the method and manner of the examination. They must be kept in mind.

Examination program:

The examination is preceded by the one great essential—the man should come for his examination with a clear vision of the advantages to be gained. He has overcome his inertia. He has decided not to wait for pains, damages, breakdowns, but to forestall them. He wants anti-aging aid to the full limit of service and skill and of scientific possibilities. The more he wants the more he will get.

If possible, he should be furnished with a full length history or record to fill out in advance.

The examination itself is done in three parts; each takes about an hour.

The first visit: This is the "pilot" examination. The examinee's story is heard in full with his history record. This begins a diagnostic survey covering

ancestry, history, and all body parts, organs, and services, blood pressure, heart, lungs, abdomen, joints, nerves, eyes, ears, hopes and fears, etc., etc. There is also a search for clues of aging, and every clue is followed up. Tests, reports and X-rays are ordered. This is the "data gathering" visit.

The second visit: The physician analyzes all items of evidence and all data, retests, rechecks, and correlates all information in terms of the whole body and the whole life. Anti-aging possibilities are looked for, and action prescribed. Correction and treatment to be undertaken at once are planned and initiated. A preliminary life program, remedial and constructive, is planned and given. It is to be tried out and reported on at the next visit.

The third visit: After two to four weeks, the results of the preliminary program are checked, retests are made, and then the full health program for six months or a year is given with all the necessary prescriptions, and with the main points in writing for the patient's own guidance. Anti-aging procedures will be planned and arrangements made for them to be carried out as the occasion warrants. Every doctor has his own method which is varied for every applicant.

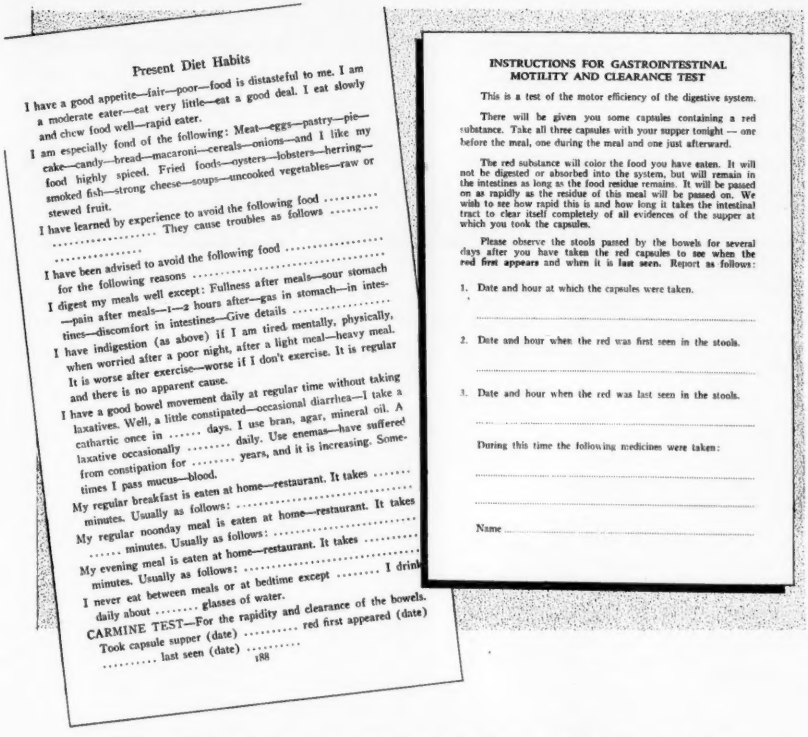
The standard examination:

Everyone would be glad to be furnished a standardized routine for the geriatric examination. I shall not attempt to do this. I recommend it as a project for the American Geriatric Society. This is a difficult and dangerous task because the minimum form may be accepted as a comprehensive statement of the optimum procedure.

STIEGLITZ states: "Standardization in either diagnosis or therapy is not compatible with the degree of individualization necessary in the care of mature or senescent adults. Personal preventive or constructive medicine, in contrast to public health medicine, cannot be cheapened by *wholesale, mass production techniques* without destroying its most valuable characteristic: individualization. It will require the collaborative effort of many clinical specialists to define the minimum requirements for an adequate health inventory."

An examination done by an experienced, understanding physician who goes "all out" to help his man build an excellent life, done without any examination forms at all, is worth a hundred times more than an examination which consists of filling out the best forms possible and nothing else. Nevertheless, examples that have excellent procedure and good forms are helpful. No one should fail to study the forms of the clinic of Dr. Malford W. Thewlis, of Wakefield, Rhode Island.

THE STUDENT of the geriatric examination might find something of interest in the forms (see Fig. 1a and b and Fig. 2a) and methods which have been developed by the writer during the last 30 years in clinic and individual



Present Diet Habits

I have a good appetite—fair—poor—food is distasteful to me. I am a moderate eater—eat very little—eat a good deal. I eat slowly and chew food well—rapid eater.

I am especially fond of the following: Meat—eggs—pastry—pie—cake—candy—bread—macaroni—cereals—onions—and I like my food highly spiced. Fried foods—oysters—lobsters—herring—smoked fish—strong cheese—soups—uncooked vegetables—raw or stewed fruit.

I have learned by experience to avoid the following food .....
..... They cause troubles as follows .....
.....

I have been advised to avoid the following food .....
for the following reasons .....

I digest my meals well except: Fullness after meals—sour stomach—pain after meals—1—2 hours after—gas in stomach—in intestines—discomfort in intestines—Give details .....

I have indigestion (as above) if I am tired mentally, physically, when worried after a poor night, after a light meal—heavy meal. It is worse after exercise—worse if I don't exercise. It is regular and there is no apparent cause.

I have a good bowel movement daily at regular time without taking laxatives. Well, a little constipated—occasional diarrhea—I take a cathartic once in ..... days. I use bran, agar, mineral oil. A laxative occasionally ..... daily. Use enemas—have suffered from constipation for ..... years, and it is increasing. Sometimes I pass mucus—blood.

My regular breakfast is eaten at home—restaurant. It takes .....
minutes. Usually as follows: .....

My regular noonday meal is eaten at home—restaurant. It takes .....
..... minutes. Usually as follows: .....

My evening meal is eaten at home—restaurant. It takes .....
minutes. Usually as follows: ..... I drink
daily about ..... glasses of water.

I never eat between meals or at bedtime except .....

CARMINE TEST—For the rapidity and clearance of the bowels.
Took capsule supper (date) ..... red first appeared (date)
..... last seen (date) .....

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INSTRUCTIONS FOR GASTROINTESTINAL MOTILITY AND CLEARANCE TEST

This is a test of the motor efficiency of the digestive system.

There will be given you some capsules containing a red substance. Take all three capsules with your supper tonight — one before the meal, one during the meal and one just afterward.

The red substance will color the food you have eaten. It will not be digested or absorbed into the system, but will remain in the intestines as long as the food residue remains. It will be passed on as rapidly as the residue of this meal will be passed on. We wish to see how rapid this is and how long it takes the intestinal tract to clear itself completely of all evidences of the supper at which you took the capsules.

Please observe the stools passed by the bowels for several days after you have taken the red capsules to see when the **red first appears** and when it is **last seen.** Report as follows:

1. Date and hour at which the capsules were taken.

.....

2. Date and hour when the red was first seen in the stools.

.....

3. Date and hour when the red was last seen in the stools.

.....

During this time the following medicines were taken:

.....

.....

Name .....

Fig. 1. Forms used in geriatric examination. a. Patient's record of dietary habits (from Medical Examination and Personal Health Record). b. Instructions for gastrointestinal motility and clearance test. N.B. The standard time for first appearance is 12 hours. A little faster or slower may be normal but merits attention. Complete disappearance in 36 hours is standard. Any departure from this point merits attention in proportion to extent of speed or delay.

practice. They are based upon "Medical Examination and Personal Health Record,"* a booklet of convenient size, which can be sent to the examinee to fill out in part before the first examination. It contains also a brief medical examination record and, in addition, individualized prescription of diet and exercise with a place for the record in following the constructive program.

This was first tried out at our Health Service Clinic of the Post Graduate Medical School and Hospital, established in 1925, and has been used as a model for clinic and private practice at various times and places. It outlines the whole program of examination, treatment, counseling, progress, and program.

*Public Affairs Committee, 22 East 38th St., New York City.

In connection with this effort a procedure of simple physical test and personal record has been devised (see Fig. 3). It provides for a day by day,

Record Prescription

Date Name

DAILY PROGRAM

	Time	Food and Drink	Bowels Urine	Exercise	Medication	Rest Occupation
Upon Awakening						
Before Breakfast						
Breakfast						
After Breakfast						
During the Morning						
Before Lunch						
Lunch						
After Lunch						
Afternoon						
Before Evening Meal						
Evening Meal						
After Evening Meal						
Evening						
Before Retiring						
Bedtime						
Sleep						
Comments						

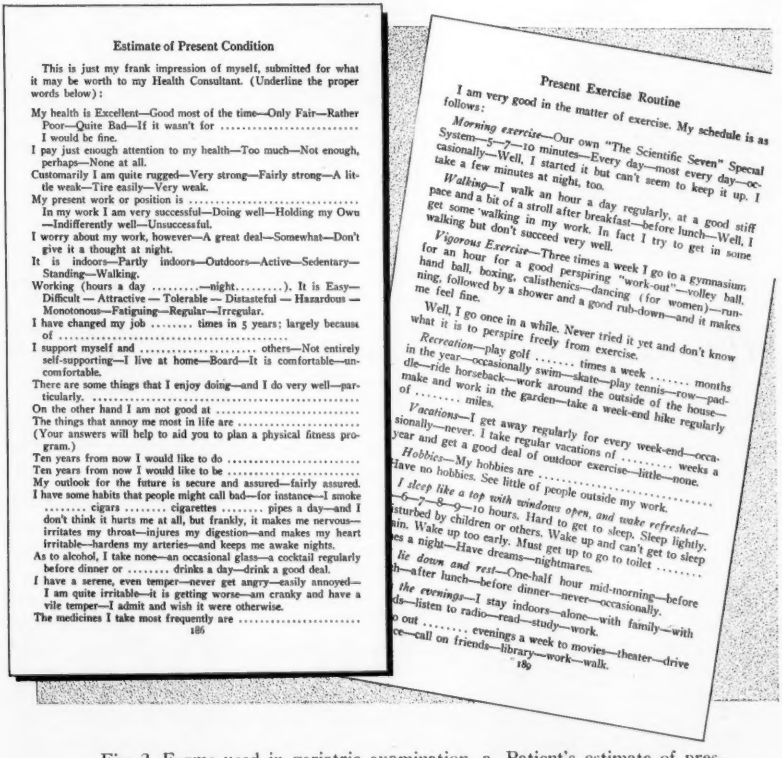
Fig. 3. Daily Program Report. A practical method of obtaining a record of what the examinee does for four days: Exercise, food, medicine, rest, occupation, etc., also his ability and willingness to make a good report. Essential data in all geriatric examinations.

hour by hour, record of diet, rest, work, occupation, medication, bowels, and urine, for at least four days. At the beginning of this period a gastro-intestinal motility and clearance test is begun (see Fig. 2b). This consists in providing 15 grains of carmine to be taken on the evening of the first day. This colors the meal and watch is kept to observe first and last appearance of red in the stools. The patient, and the physician also, may sometimes be astonished to find that in spite of a daily evacuation, carmine will keep coming for seven or eight days—an item of great importance. At the same time 2 grains of a dye are given and watch is kept on the appearance and disappearance from the urine. This will take from 12 hours to 12 days. On completion of the four days of life and food management record, a urinalysis sample is taken, after a period of 12 hours without fluid. This provides, in addition to the ordinary findings, a simple kidney concentration record and it gives the physician the background of the diet and life management of three days preceding. This gives a much greater body of information than the simple, ordinary, morning specimen of urine.

The next step:

After the examination the next step is to initiate de-aging procedures. That is the removal of all removable pathological conditions, the rehabilitation of substandard physical processes, the extraction of bad life management methods from the life program. This may require treatment and medication of any or all kinds. This is followed by a period of training and watchful management which lasts the rest of the prolonged and privileged life.

This geriatric service which begins with the examination is the only thing that is worthwhile. The examination itself is fruitless unless geriatric service is undertaken and carried forward. The results of this service are proving themselves to be more solid, satisfactory, and enduring, than many of the miracles hoped for and promoted by the sincere efforts of Voronoff, Brown-Sequard, and Steinach, and they approach the realization of the hopes, labor, and vision of the scientists of today.



Estimate of Present Condition

This is just my frank impression of myself, submitted for what it may be worth to my Health Consultant. (Underline the proper words below):

My health is Excellent—Good most of the time—Only Fair—Rather Poor—Quite Bad—If it wasn't for .....
I would be fine.
I pay just enough attention to my health—Too much—Not enough, perhaps—None at all.
Customarily I am quite rugged—Very strong—Fairly strong—A little weak—Tire easily—Very weak.
My present work or position is .....
In my work I am very successful—Doing well—Holding my Own—Indifferently well—Unsuccessful.
I worry about my work, however—A great deal—Somewhat—Don't give it a thought at night.
It is indoors—Partly indoors—Outdoors—Active—Sedentary—Standing—Walking.
Working (hours a day .....—night.....). It is Easy—Difficult — Attractive — Tolerable — Distasteful — Hazardous — Monotonous—Fatiguing—Regular—Irregular.
I have changed my job ..... times in 5 years; largely because of .....
I support myself and ..... others—Not entirely self-supporting—I live at home—Board—It is comfortable—uncomfortable.
There are some things that I enjoy doing—and I do very well—particularly. .....
On the other hand I am not good at .....
The things that annoy me most in life are .....
(Your answers will help to aid you to plan a physical fitness program.)
Ten years from now I would like to do .....
Ten years from now I would like to be .....
My outlook for the future is secure and assured—fairly assured.
I have some habits that people might call bad—for instance—I smoke ..... cigars ..... cigarettes ..... pipes a day—and I don't think it hurts me at all, but frankly, it makes me nervous—irritates my throat—injures my digestion—and makes my heart irritable—hardens my arteries—and keeps me awake nights.
As to alcohol, I take none—an occasional glass—a cocktail regularly before dinner or ..... drinks a day—drink a good deal.
I have a serene, even temper—never get angry—easily annoyed—I am quite irritable—it is getting worse—am cranky and have a vile temper—I admit and wish it were otherwise.
The medicines I take most frequently are .....

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Present Exercise Routine

I am very good in the matter of exercise. My schedule is as follows:

Morning exercise—Our own "The Scientific Seven" Special System—5—7—10 minutes—Every day—most every day—occasionally—Well, I started it but can't seem to keep it up. I take a few minutes at night, too.

Walking—I walk an hour a day regularly, at a good stiff pace and a bit of a stroll after breakfast—before lunch—Well, I get some walking in my work. In fact I try to get in some walking but don't succeed very well.

Vigorous Exercise—Three times a week I go to a gymnasium for an hour for a good perspiring "work-out"—volley ball, hand ball, boxing, calisthenics—dancing (for women)—running, followed by a shower and a good rub-down—and it makes me feel fine.

Well, I go once in a while. Never tried it yet and don't know what it is to perspire freely from exercise.

Recreation—play golf ..... times a week ..... months in the year—occasionally swim—skate—play tennis—row—paddle—ride horseback—work around the outside of the house—make and work in the garden—take a week-end hike regularly of ..... miles.

Vacations—I get away regularly for every week-end—occasionally—never. I take regular vacations of ..... weeks a year and get a good deal of outdoor exercise—little—none.

Hobbies—My hobbies are .....
Have no hobbies. See little of people outside my work.

I sleep like a top with windows open, and wake refreshed—6—7—8—9—10 hours. Hard to get to sleep. Sleep lightly. isturbed by children or others. Wake up too early. Wake up and can't get to sleep ain. Wake up too early. Must get up to go to toilet .....
es a night—Have dreams—nightmares.

lie down and rest—One-half hour mid-morning—before h—after lunch—before dinner—never—occasionally.

the evenings—I stay indoors—alone—with family—with ds—listen to radio—read—study—work.
o out ..... evenings a week to movies—theater—drive ce—call on friends—library—work—walk.

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Fig. 2. Forms used in geriatric examination. a. Patient's estimate of present condition. b. Patient's record of exercise and rest habits. (Both from Medical Examination and Personal Health Record.)

SUMMARY

THE GERIATRIC examination includes all that has to do with age and aging, as well as illness and disability. Its purpose is to give a foundation and guidance for a program of life management which includes cure, prevention, and amelioration of illness, postponement of aging and disability, increase of vigor and vitality, and insofar as possible, de-aging. It is holistic. The whole man and the whole life are examined, the whole man and the whole life are served.

Since age is of the essence, age is analyzed, and seven ages of man are proposed, defined, discussed, and their service applied to the examination procedure. Four are biological in character: anatomical age, physiological age, psychological age, and pathological age. Three are ages of record: chronological age, statistical age, and hereditary age.

The examination itself is described, and a practical procedure given with forms for simple test procedures.

Immediate correction of remediable conditions begins the anti-aging program. Geriatric service and health coaching through life are emphasized.

Thus, the geriatric examination introduces life-long geriatric service; remedial, preventive, and constructive. It has already proven its value and the future is bright and challenging.

COMMENT BY MALFORD W. THEWLIS, M.D.

DR. CRAMPTON'S early work on preclinical medicine was an inspiration to me. I followed many of his ideas on the prevention of disease. Today there is great demand for the type of examination he advocates. The difficulty is that few physicians seem to be preventive-minded; they are not willing to spend the time to do thorough check-ups. It does require time to do this work. To take a good history alone requires an hour's time. The physical examination may take another hour. Then the laboratory procedures follow these examinations. As a routine I like patients to have a roentgenogram of the chest, complete blood cell counts, icterus index, sedimentation test, urinalysis, and any other tests which may be indicated. If the patient is past fifty, he might have a basal metabolism test, electrocardiogram, blood sugar, nonprotein and cholesterol estimations. If there are any symptoms pointing to the gastrointestinal tract, there should be oral cholecystography, gastrointestinal series, and barium enema.

After these are completed, the results should be given to the patient and a record given to him. This is necessary in case he travels or sees another physician. He is told what hygienic measures to follow, proper diet is explained, and he is interested to avoid anything which seems detrimental. Any treatment should be explained at this time. He should be given a list of what his examination a year from now should be. Naturally not all tests need to be repeated after a year, but all tests become more valuable when they are compared with previous ones. I hope that physicians will study Dr. Crampton's article thoroughly.

Hypertensive Heart Disease In Older Patients*

Gabriel F. Greco, M.D.†

HYPERTENSIVE heart disease is a major cause of heart failure in the aged and is greatly responsible for the increase in mortality among the older patients. The problem has been assuming tremendous proportions because of the progressive aging of the population. The importance of the degenerative diseases of advanced age becomes apparent when the deaths and the death rates in the United States are analyzed for each cause for the year 1944-1946. The most frequent cause of death is diseases of the heart which accounted for 30 per cent of all deaths.[1] Between 1900, the first year for which annual mortality statistics are available, and 1946, the crude death rate decreased from 17.2 to 10.0, or 42 per cent. The sharp drop in national crude death in 1946 to 10.0 was heavily weighted by the higher mortality of the older age group which comprised a larger proportion of the population. The greatest decline in mortality has occurred at the younger age groups, the largest relative decrease in death rates occurring among young children one to four years of age, with a corresponding drop in mortality of 91 per cent. The smallest relative decline of 20 per cent occurred for persons 75 years and over. The major trend has been the tremendous reduction in mortality from the infectious diseases most prevalent in infancy and young adult life through great progress in research and treatment and the advances in public health. The rise in mortality has accompanied the rise in the chronic degenerative diseases of the older age groups, due to the gradual aging of the national population and also to the recognition of these chronic diseases as the causes of death. Of interest also is the higher crude death rates reported for New England, the Middle Atlantic and North Central divisions. Rates were lower in the Southern Mountain and Pacific divisions. This geographic variation reflects merely the difference in the composition of state populations as to age rather than the difference as to climate or greater stress of life. The high proportion of older persons in the populations of the extreme Northeastern States is an important factor in the comparatively high death rates in this region.[2]

A MAJOR CHALLENGE

IN ORDER to confront this major challenge of an increasing mortality of older patients from degenerative diseases the geriatrician will have to call upon the resources of coordinated research. At present he must meet this challenge

*Read at the Sixth Annual Meeting of the American Geriatrics Society, Atlantic City, N. J., June, 1949.

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by equipping himself with knowledge not only of the multiplicity of factors in the pathogenesis of hypertensive heart disease, but also of the superimposed or associated senescent changes in heart and blood vessels.[3] This panoramic view will allow the proper evaluation of all factors and prevent the analyzing of this disease from a single perspective, be it the autonomic nervous system, the endocrine glands, the diet and the basic changes of the aging vascular tree. (Figs. 1 and 2.) Acquainted with the phenomenon of aging and the numerous fundamental characteristics of this disease, one may by wise management keep the patient at an optimum peak of usefulness and efficiency for his age and in accordance with his limitations.

GABRIEL F. GRECO, M.D.

SYMPTOMS AND PHYSICAL SIGNS

Hypertensive heart disease refers to cardiovascular hypertrophy as evidenced by clinical, radiological and electrocardiographic findings in a patient with determinable concurrent organic changes in the arteriolar supply of other tissue, especially in the coronary, cerebral and renal vessels. The condition is usually accompanied by a rise in the diastolic and systolic pressure. This is not always a constant finding, however, for many times following coronary or cerebral thrombosis, the blood pressure falls and remains low even after recovery. Several factors have been suggested as responsible for this disease, but the real cause still remains an enigma. There are several stages involved. First, there is a constitutional basis, an hereditary vulnerability with a specific type of personality involved: the overnervous, overanxious type, reacting with varying degrees of transient blood pressure rise to emotional stimuli. Second, if these episodes are not checked over the years, there is a continuing hyperactivity of the arterioles which acts as a pattern of reaction. These arteriolar spasms are of functional nature, relaxation occurring

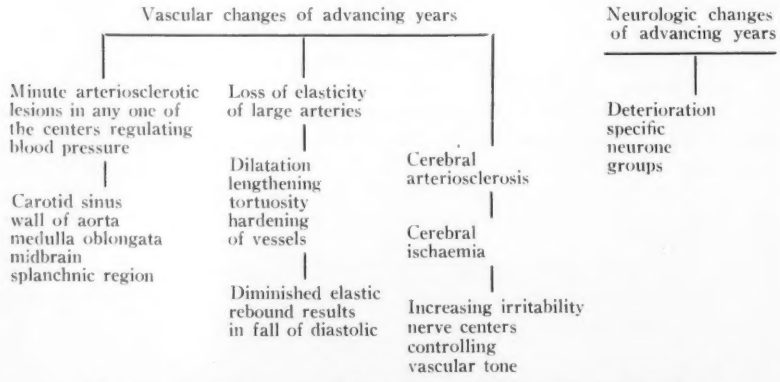

FIG. 1. Some factors concerned in the genesis of systolic hypertension in the aged.

with rest. Third, these changes resulting from long continued strain lead to persistent spasm, thickening of the medial musculature of the arterioles. This increases the peripheral resistance, resulting in subnutrition and suboxygenation of all the tissues involved. This in turn accelerates the natural physiologic process due to aging, causing degenerative changes resulting in intimal fibrosis and replacement by collagenous connective tissue. In the kidney the ischaemia due to restricted blood flow has given rise to the theory that an enzyme

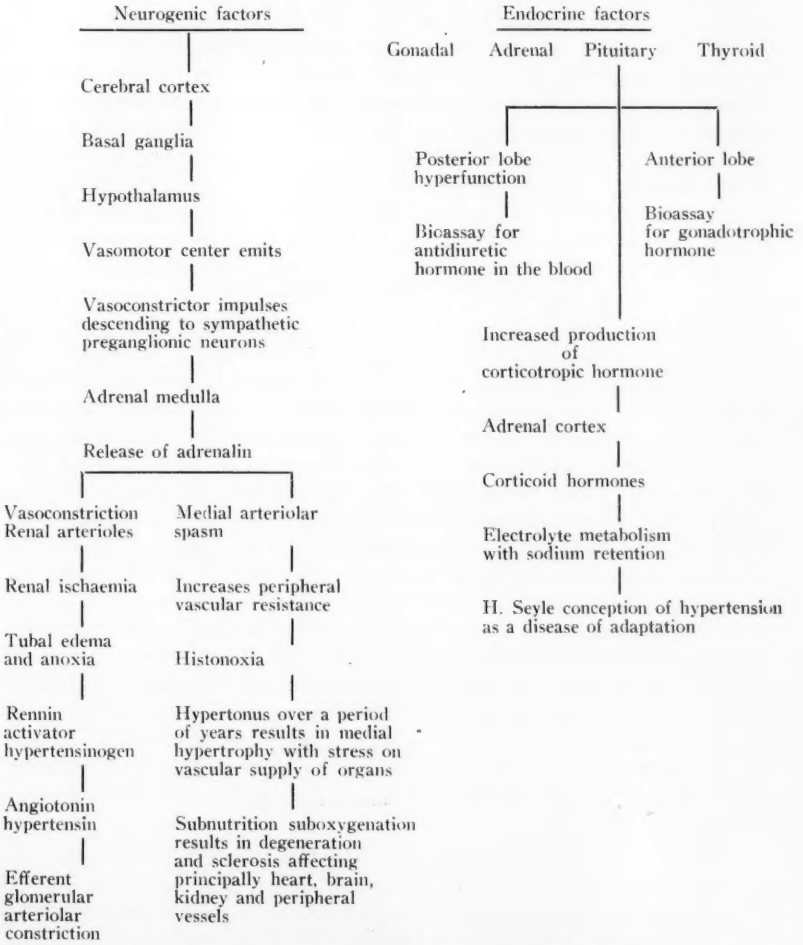

FIG. 2. Some factors concerned in the pathogenesis of diastolic hypertension.

rennin is released in the blood where it reacts with hypertensinogen to form the pressor substance hypertensin which perpetuates the disorder. If, to the crying need of tissues for oxygen, there is added the load of an increase in body weight, further damage will occur in the heart.[4]

THE SYSTOLIC COMPONENT

AN ELEVATED systolic with a falling diastolic is commonly found in the elderly patient without any significant abnormalities of the cardiovascular system. The frequency of this type of hypertension increases with age, having been noted in more than one-third of one series of males over 60.[5] Such elevation has been attributed to a vascular mechanism, associated with the process of aging and consisting of involutionary vascular changes. There results a diminution in the elasticity of the aorta with consequent elongation and tortuosity. A neurogenic factor has also been blamed in the production of systolic hypertension, consisting of an increasing irritability of the vasoconstrictor medullary center, brought on by ischaemia, secondary to minute arteriosclerotic lesions in this area,[6] or by deterioration of specific neurone groups.[7]

THE DIASTOLIC COMPONENT

OTHER factors, however, are often loaded on this mechanism of systolic hypertension as age advances. These factors may include an overactivity of the autonomic nervous system or renal, toxic, and hormonal influences, which tend to augment both systolic and diastolic pressures. This resultant diastolic hypertension cannot be regarded as part of the process of aging, but rather as a manifestation of a disease whose many unsolved problems, like the scattered pieces in a jigsaw puzzle, remain too difficult to assemble into a perfect picture. This diastolic hypertension resulting in medial hypertrophy with subsequent degeneration and replacement fibrosis is often superimposed on a patient undergoing senescent changes. The process of atherosclerosis becomes thus accelerated in the thickened subendothelial connective tissue. These changes occur at different rates of speed in different organs and affect different individuals in different ways, possibly following an hereditary pattern.[8] These changes are greatly modified in the older patient as compared to the young adult in that they develop against a background of senescent changes which tend to dominate or color the disease with manifestations of a benign rather than a malignant nature. The increased diastolic places a greater load on the left ventricle and results eventually in hypertensive heart disease.[9]

HYPERTENSION AND ARTERIOSCLEROSIS

HYPERTENSION and arteriosclerosis, often coexistent in the same age groups, are in reality separate pathological conditions. Yellow flecks may be scattered over the intima of the aorta, most pronounced at sites of acute branching

involving the openings of small arterial vessels and their collateral channels. These may later be replaced by atheromatous plaques. Arteriosclerotic changes may also affect the media and outer coat. The arteries may be converted into brittle tubes. Calcareous lesions may involve the auricular-ventricular conduction system, producing most frequently in the older patient either auricular fibrillation or bundle branch block. These arteriosclerotic changes may result in nutritional failure with serious damage to involved tissue or they may be neutralized by compensatory collateral anastomoses.[10]

COURSE AND COMPLICATIONS

Hypertensive heart disease in the older patient usually takes a benign course with few of the distressing complications seen in the young. These patients live for a good many years without many signs or symptoms until the strain on the vascular tree becomes manifest. These complications can be indefinitely postponed and lessened in severity by early treatment and management. It is not the height of the pressure which is important but rather the condition of the vascular tree which determines the progress of these complications and why the course of the disease is long in one individual and shorter in another. The strain on the left ventricle is at first a sign of efficiency in that the heart is attempting to accommodate itself to the increased peripheral resistance. In time, however, the increase in work will lead to increase in muscle mass without a concomitant increase in coronary circulation. Sooner or later the coronary blood flow is unable to supply the heart; a disproportion develops between supply and demand. Early in the course of the disease this disproportion may come so slowly over months or years that it may be discovered accidentally in the course of an examination for life insurance. Later there may be complaints of breathlessness on mild effort, an increasing sense of fatigue, palpitation and insomnia. As time goes on the dyspnea increases in severity followed by distressing episodes of severe paroxysmal dyspnea, occurring usually several hours after retiring. In these patients there is vascular strain with wear and tear, accentuation of atheromatous changes with narrowing of arterial lumen. There may be signs of coronary artery disease: coronary insufficiency and angina pectoris, and later coronary thrombosis. There may also be signs of loss of cardiac reserve. In left ventricular failure, there is often a gallop rhythm and pulsus alternans. If these continue, right ventricular failure develops with systemic distension, palpable liver and oliguria. There is an increase in urinary concentration with albumen and casts.

FLUOROSCOPY, TELERADIOGRAPHY, AND ORTHODIAGRAPHY

Early cases do not show enlargement of the heart but later in the course of the disease, when there is gross enlargement, percussion will show the progressive increase. It is a simple, accurate method.[11] For more detailed studies one can utilize fluoroscopy, teleradiography and orthodiagraphy.[12, 13]

Even a negative film can be most valuable later as a comparative normal for the individual. As the disease advances, on fluoroscopic examination in the anterior posterior position, one can follow the changes in the heart shadow. First there is an enlargement of the left ventricle due to increase in muscle mass which gives a convex rounding to the left border of the heart. There is an elongation of the silhouette, indicating dilatation of the left ventricle, involving chiefly the outflow tract which extends from apex to aortic valve. The rounded apex is displaced to the left and down toward the chest wall, plunging posteriorly below the dome of the diaphragm. This rounded convex outline representing left ventricular mass persists in deep inspiration and does not disappear. There is also seen a widening of the aorta. If elongated the aorta will reach at its transverse portion almost below the level of the clavicles, and its arch will project into the left lung field, revealing often in this portion areas of calcifications. The descending aorta is best seen in the right anterior oblique showing elongation and calcific deposits, when present. The late phase of left ventricular hypertrophy may be seen in the inflow tract, mitral valve to apex, in the left anterior oblique position, this shadow bulging toward the vertebral spine. The existence of pulmonary stasis and the frequent presence of calcific deposits in the aged may be visualized. These calcifications usually occur in the arch and in the transverse and descending portions of the aorta. Calcifications of aortic and mitral rings can also be visualized.[14]

ELECTROCARDIOGRAPHIC FINDINGS

Although normal tracings may be found, the electrocardiogram in the asymptomatic stage may often present the only evidence of hypertensive heart disease. Serial changes are of great help in charting medical treatment and evaluating progress. Even though negative an electrocardiogram early in the course of the disease is most valuable, because it serves later as a guide in the interpretation of the individual record. Familiarity with the electrocardiogram as usually found in the elderly, obese, broad-chested individual with high diaphragm and transverse heart will help in recognizing a pattern conducive to left axis deviation, caused merely by shifting of the position of the heart. It is upon this pattern in the obese older patient that the signs of left ventricular hypertrophy and strain are later superimposed with the resulting high voltage of the QRS complexes, with deep S waves in leads II and III, augmenting markedly the already existing left axis deviation of the electrical axis. This high voltage of the QRS is due to the increased left ventricular mass, with an increased potential directed toward the left arm. The other changes are confined to ST segment depression and T wave inversion, asymmetrical usually, in leads I and often in II with ST elevation in III. The ST segment changes and T wave changes are due to relative ischaemia brought on by a disproportion between the cardiac muscle mass involving chiefly the left ventricle and coronary blood flow and to chemical changes affecting myocardial nutrition.

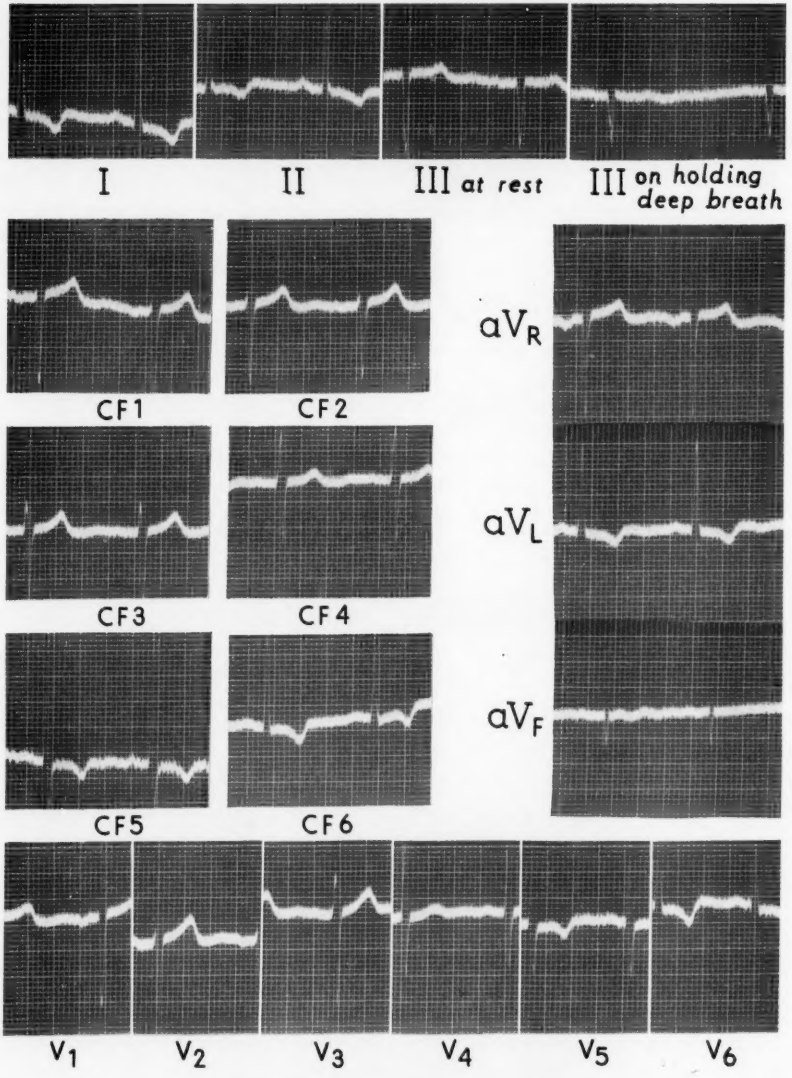

FIG. 3. C. P., a 66-year-old woman with hypertensive heart disease. Left ventricular hypertrophy in a horizontal heart.

Standard limb and CF precordial leads: note classic RST-T contour in leads I, II, CF_5 and CF_6. The voltage of R_1 plus S_3 is beyond the critical level. Unipolar and precordial V leads: note classic contour in aV_L, V_5 and V_6 and the upright T wave in a V_R. The voltages of R in aV_L and of R in V_5 plus S in V_1 are beyond the critical level.

In the thin elderly individual, the electrocardiogram may not show any characteristic changes early in the course of the disease. It will reveal the pattern of thin-chested individuals with low diaphragm and a vertical heart. Later on in the course of the disease one finds the characteristic ST segment and T wave changes of hypertrophy and strain in the absence of left axis deviation.

THESE changes of relative ischaemia and injury in the heart lead over a period of time to the involvement of the conduction system. Taken early, the widening of the QRS interval may be due to the increase in time that it takes the stimulus to travel through the larger muscle mass. Later, in chronic hypertrophy associated with prolonged changes of relative ischaemia and injury, areas of irreversible damage occur and fibrosis develops slowly in the conduction system. With involvement of the left bundle and its branches, QRS complexes become slurred, widened and notched giving rise to the various forms of intraventricular conduction block. Areas of fibrosis in the auricles result in auricular fibrillation and auricular flutter.

In addition to the standard limb and precordial leads, unipolar augmented limb leads of Goldberger and unipolar precordial leads furnish additional information pertaining to the position of the heart and the early patterns of hypertrophy and strain.[15, 16, 17] These leads are particularly valuable when estimating RST-T changes in the absence of left axis deviation. Because of the transmission of the left ventricular potential to the left leg in persons with vertical hearts, the characteristic RST-T changes of left ventricular hypertrophy will occur in the aVf and in II and III leads. The precordial leads are similar for vertical and horizontal hearts. The dissimilarity in the standard leads between the vertical hearts, without left axis deviation, and the horizontal heart, which has the left axis deviation in addition to the RST-T changes, merely reflects position of the heart. Abnormal voltage of QRS is seen readily in unipolar left arm lead in horizontal hearts because the left ventricle points toward the left arm; these changes are reflected in lead I and V_5 and V_6. In vertical hearts, the potential voltage changes and RST-T changes are reflected in aVf, where the left ventricle potentials are transmitted, and to a lesser extent in leads II and III. Depressed RST segment with low, flat or diphasic or asymmetrically inverted T waves are seen in the precordial leads, particularly in V_5 and V_6 in association with an abnormally high QRS voltage, a delayed onset of the intrinsic deflection exceeding 0.05 second in these same positions. The S wave over the right precordial leads is very deep. (Fig. 3.)

MANAGEMENT

THE SUCCESSFUL management of this disease is based on absolute cooperation between patient and physician. The doctor should become familiar with the personality of the hypertensive, and the entire life of the patient must be

reviewed in relation to his social and economic goals. Analysis of the many factors that produce the pattern through social and business conflicts will enlighten the patient as to the nature of his disease. He must be made to realize that overexertion, whether muscular or mental, with no time for relaxation, will strain the heart. Success in treatment, at least for the present, will not be due to the use of drugs, but rather to a reorientation of the patient's life within the limits of his mental and physical reserves. He must be taught to establish moderate habits of living with hobbies, vacations and daily rest periods lessening vascular strain. He should be made to realize that blood pressure readings are subject to wide daily fluctuations under excessive emotional and physical strain and that they become markedly lowered with sensible living. Each problem must be considered individually and interpreted with a sympathetic and hopeful attitude. This attitude is justified by the manner in which the heart in older people usually stands repeated attacks of failure and repeated insults of pressure over a period of many years. Early management will mean greater success in the tempering of ambition and routing life along a less stormy course.

DRUGS should be used with caution in the aged. Sedation with bromides and phenobarbital, given routinely throughout the day, can lead to a state of confusion, restlessness and disorientation and seriously curtail fruitful activity and enjoyment of living especially in those who are oversusceptible. Impaired renal function, diminished metabolism and a sluggish liver are commonly associated with aging. The routine use of these drugs may speed up the process of deterioration and degeneration of tissues. If drugs are needed for sedation, they should be used at night. Chloral hydrate and paraldehyde are less depressive and safer. Alcohol in moderation given before retiring often insures a good night's rest.

Weight reduction is highly desirable for the obese for often as they lose weight, the pressure comes down, merely by depressing the load on circulation.

When acute left ventricular failure supervenes, morphine sulfate with atropine sulfate will often terminate the attack. Aminophylline in dextrose solution will be most helpful in controlling Cheyne-Stokes breathing, will eliminate bronchial and coronary spasm and supply ready available glucose to the myocardium. When sudden failure calls for immediate action, strophanthin given slowly in patients who have had no digitalis, restores compensation rapidly. When the venous pressure is much increased and the heart is in great danger because of tremendous strain, a phlebotomy may be lifesaving. One or several of these measures may be needed to terminate the attack. There may be no recurrence for a long time, but it is wise to follow this emergency treatment with adequate digitalization. To prevent the attacks of paroxysmal dyspnea and edema, especially in a patient whose attacks are associated with a critical weight level, mercurin may have to be used as often as the weight needs control. Ammonium chloride, a day before the

mercurial, may help diuresis. Care should be taken to avoid too rapid dehydration and acidosis in the aged. The diet should be well balanced and low in sodium. The purpose of treatment is to keep the weight at an optimum level conducive to the individual's freedom from dyspnea and palpitation. The complications of coronary artery disease are treated according to methods previously outlined.[18, 19]

SUMMARY AND CONCLUSIONS

1. Hypertensive heart disease is a major cause of heart failure in the aged and is greatly responsible for the increase in mortality among older patients. Although many valuable contributions have already been made, there are still wide gaps in our knowledge of this disease. There is great need for research to speed up progress.
2. The pathogenesis of hypertensive heart disease in older patients cannot be analyzed from a single perspective. There are a multiplicity of factors superimposed on associated senescent changes in heart and blood vessels. Wise management presupposes acquaintance with the phenomenon of aging.
3. Hypertensive heart disease refers to cardiovascular hypertrophy as evidenced by clinical, radiological, and electrocardiographic findings.
4. The clinical course and mechanism reveal the benign character of the disease in the aged. The systolic hypertension of advancing years which is associated with a falling diastolic pressure has been analyzed and compared with the pathologic diastolic hypertension, which causes the characteristic picture of hypertensive heart disease.
5. The radiological study stresses the determination of heart enlargement and the finding of associated calcific changes of advancing years in aortic and mitral rings and in the aorta.
6. The characteristic electrocardiographic findings which are more sensitive and appear earlier than the X-ray findings have been analyzed as they appear in both obese and thin elderly patients. The various changes in these two groups have been discussed.
7. Treatment emphasizes the need of reorientation of the patient within the limits of his own physical and mental reserve quotient. Moderation with contented acceptance of these limitations may help the older person live a richer and fuller life.
8. Because of the multiplicity of factors involved, no single method of management will fit all cases. Control of predisposing and precipitating factors will prevent or at least retard the perpetuating pathology which brings about cardiac, cerebral, renal and other accidents. Even when these accidents occur, and particularly when hypertension leads to coronary heart disease, further help may be given. Thus a more hopeful and brighter outlook is most justified in the older patient with hypertension until such time as combined research solves this enigma and permits a more direct approach to treatment.

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EMPLOYMENT OF THE ELDERLY IN BRITAIN*

Under present British law, unemployed men and women become eligible at 65 and 60, respectively, for pensions ranging from 26s. to 37s. a week, depending upon need. Employed persons earning more than £1 a week are ineligible until the age of 70, at which time they are awarded an additional 1s. a week for every 25 payments they have foregone. Small though the pension is, the increasing number of applicants indicates the total annual cost to the country may, within a few years, reach the alarming figure of 500,000,000.

A solution lies in encouraging pensioners to continue working. Recent studies show that occupation is beneficial to the health and morale of the elderly, while their efficiency often remains high for some years. Furthermore, the Government's full employment policy promises that employment of pensioners need not result in unemployment of younger workers.

*The employment of elderly persons. Lancet 258:469-470, 1949.

Anesthesia in the Aging Group*

William A. Weiss, M.D.†

THE PHYSIOLOGICAL state of the cardiovascular system is a most important consideration in the anesthetic management of the aging patient. Some elderly patients show little degenerative changes and can be classed physiologically as much younger than their chronological age. On the other hand, there are younger persons just past 45 with many degenerative changes who are really physiologically old. Approximately 50 per cent of all persons suffering from chronic disease are over 45 years of age. As many of the trap doors which cause death in the younger group are being closed by chemotherapy and new surgical procedures, many more people are living to a ripe old age. Numerous authors have advised the careful use of drugs in the aging group.

The choice of an anesthetic agent is determined after a thorough preoperative evaluation of the patient. Because many distressing problems must be met, it is essential to evaluate the cardiovascular and respiratory reserve as accurately as possible. The functional ability of the liver and kidneys, as well as general metabolism, play an important role.

Premedication. It is a commonly accepted opinion that the opiates cause a marked central depression in this age group. Morphine may depress out of all proportion to its expected narcotic effect. Severe hypotension and respiratory depression result in cerebral anoxia, and psychic changes may develop. Demerol (50 mgm.) seems to be less depressing and is used for the relief of pain. The long-acting barbiturates such as barbital and phenobarbital are eliminated unchanged in the urine, and are contraindicated in patients with kidney disease. The intermediate and short-acting barbiturates are used cautiously in liver disease as these drugs are destroyed in the liver. The aged patient is usually well composed and not apprehensive, so that barbiturates are not necessary. Chloral hydrate in doses of 0.6 gm. to 1 gm. (10-15 gr.) is of value if some psychic sedation is necessary. Atropine, 0.3 mgm. (1/200 gr.), is an aid in reducing reflex activity and secretions. Scopolamine may produce a state of euphoria or marked depression, in both instances making it difficult to obtain the necessary cooperation. It is far better to supplement insufficient premedication than to attempt to anesthetize an over-premedicated patient, a procedure which is both difficult and dangerous.

Choice of anesthetic agent. The circulatory system loses many of its compensatory mechanisms through arteriosclerosis and tissue degeneration. Some degree of emphysema is present with impairment of vital capacity and alveolar exchange. Liver and kidney tissue have a lowered reserve.

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*Read at the meeting of the American Geriatrics Society, Atlantic City, N. J., June, 1949.

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In reviewing 673 anesthetics given to 461 patients over 70 years of age, Baird[1] found that cyclopropane anesthesia contributed toward the largest number of postoperative complications and deaths. Cardiac conduction defects contraindicate the use of cyclopropane. Ether is avoided in the diabetic since it tends to raise the blood sugar 100-200 per cent. In the light planes of anesthesia, ether is a cardiovascular stimulant and tends to maintain a satisfactory blood pressure. Nitrous oxide-oxygen and ethylene-oxygen anesthesia in an 80-20 mixture might tend towards suboxygenation with myocardial anoxia causing damage.

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Inhalation anesthesia is used for all thoracic operations and operations on the upper part of the abdomen where it might be difficult to maintain a physiological equilibrium with any other technique. Sodium pentothal intravenously is used for induction and given slowly in small, repeated amounts to avoid respiratory depression. This is followed by a gas-oxygen to an oxygen-ether maintenance. An endotracheal technique is employed to insure a patent airway, to lessen depression by a maintenance of a lighter plane of anesthesia and for tracheal aspiration as needed. Curare is used for the desired muscle relaxation. Adequate ventilation must be maintained to avoid any degree of anoxia. The prevention of anoxia is the keynote of success in the management of these patients.

Intravenous anesthesia is used only for short procedures because of its respiratory depressing qualities, and oxygen is routinely administered. It is employed mainly for amnesia and narcosis for such procedures as cystoscopies, dilatation and curettage of the uterus, closed reductions, manipulations, and examinations.

Spinal anesthesia is associated with the greatest incidence of hypotension. Turville and Dripps[2] reported that 33 per cent of 448 patients had a drop in blood pressure to 60 or 70 mm. of mercury systolic. It is unwise to use spinal anesthesia when the blood pressure is above 180 mm. of mercury systolic. A sudden hypotension predisposes to coronary insufficiency and occlusion may occur. In using spinal anesthesia particular attention must be paid to maintain an adequate blood pressure with the use of vasopressor drugs.

THIS form of anesthesia is to be avoided whenever there is any questionable disease of the central nervous system. Pernicious anemia contraindicates the use of spinal anesthesia. It should be avoided in shock, hemorrhage or anticipated hemorrhage. The dose and level of spinal analgesia should be kept at a minimum. One hundred milligrams of procaine or 10 milligrams of pontocaine is maximum, and the level of anesthesia kept below the eighth thoracic segment. Fractional spinal with either the malleable needle or catheter technique affords the repeated use of a small amount of the anesthetic drug for prolonged operations. To relieve fear, apprehension, and undesirable

traction reflexes, Sodium Pentothal is used for amnesia and hypnosis. Oxygen is administered as a supportive measure.

Regional anesthesia has a wide application with a fair degree of success in aged patients because of their high pain threshold and philosophical nature. It may be decided upon as the method of choice, or because of the general state of the patient, it may be agreed to be the least toxic method. An inadequate block will lead to the hazards of excitation, nausea and vomiting and the possibility of aspiration when attempting supplementary general anesthesia.

Supportive therapy. Adequate replacement of properly selected fluids is vitally important for the aged patient who comes to surgery. Blood loss is poorly tolerated since the compensatory mechanisms cannot act to the fullest advantage with cardiovascular degeneration. Scrupulous care must be exercised in the administration of all fluids so as not to overload an aging heart. Intravenous fluids help to correct dehydration and assist the vascular system to accommodate for minor fluctuations in blood pressure. With the infusion started prior to operation, there is a ready means to change to blood if necessary. Blood should be replaced as it is lost because a vascular catastrophe can occur if there is a significant decrease in circulatory blood volume.

A HIGH concentration of oxygen is advised. It is routinely used with regional, spinal and Sodium Pentothal anesthesia in order to avoid any degree of suboxygenation. Oxygen should not be withheld to treat the emergency, but is most valuable in the prophylaxis.

During the immediate postoperative care, frequent turning of the patient, encouraged coughing and deep breathing is an important consideration in the prevention of pulmonary complications. A rapid recovery time from general anesthesia is dependent upon the use of the lighter planes of anesthesia, with the aid of endotracheal intubation and relaxation with the use of curare.

Postoperative complications. These may be grouped into those of cardiovascular and pulmonary origin. Dillon[3] reports that the greatest number of complications incident to anesthesia and surgery were of the vascular system. Coronary occlusion, cerebral vascular accident, and pulmonary embolism are those which may be associated with degrees of hypotension. Shock must be treated promptly and adequately in order to avoid the aforementioned accidents. Cardiac failure with pulmonary edema may be precipitated by myocardial anoxia. Renal failure may be a result of hypotension.

Pulmonary complications such as atelectasis and pneumonia may be avoided by frequent turning during the early postoperative period and then early ambulation as warranted by the general physical condition of the patient. Pulmonary edema may be prevented by an intelligent administration of postoperative fluid therapy in order to avoid an overload of the cardiovascular system.

Confusion and irrationality may be on a cerebral anoxic basis, and may be avoided with the use of oxygen postoperatively. The overuse of sedation

may precipitate a psychosis, and hence care should be exercised in the selection and dosage of sedative drugs. Morphine should be used sparingly.

SUMMARY

Surgical treatment is increasing in frequency and has much to offer the aging patient. A careful preoperative consideration of the patient's general physiological state must be made in order to intelligently manage the anesthesia. A skillful anesthesiologist will select agents and methods which will disturb the patient's physiology as little as possible. Blood and oxygen are important supportive measures. The immediate postoperative care is essential for the patient's recovery.

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OLD AGE AS A FACTOR IN ACCIDENTAL DEATHS IN NEW JERSEY*

Although the proportion of persons 65 years and older to the total population is probably about 8 per cent, yet that same group, during the first three months of 1949, accounted for 201, or 40 per cent, of all accidental deaths. Those individuals 45 years of age or older, representing about 28 per cent of the total population, had 312, or 64 per cent, of all accidental deaths charged to them.

During the first quarter of the current year, the chief hazard in accidents for persons 65 and over was falls, these being responsible for 122, or 60 per cent, of all accidental deaths for the group. Of these 122 deaths, 106, or 86 per cent, occurred in homes, either private or resident institutions. Thirty-five per cent of these home falls occurred on the same level, that is, slipping, tripping or falling was not due to any elevation other than the height of the individual from the floor. An additional 34 per cent of the 106 fatal falls were unspecified as to nature of the fall. Since it can safely be assumed that many of this group were falls on the same level, efforts should be directed toward removing hazards such as loose rugs, broken boards and highly polished floors from the home environment of the elderly person.

Of those 106 falls resulting in death to persons 65 years of age and older, 22, or 20 per cent, were caused by stairs. Care should be taken to provide handrails, non-slip treads and adequate lighting for all stairs. It should also become routine practice for frequent inspections to be made of stairs and hallways to remove children's toys under foot.

*Reprinted from Public Health News 30:239, 1949.

Splenectomy In Elderly People

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THE LIST of conditions for which splenectomy is indicated has greatly increased in length and encompasses a group of diseases that may affect elderly individuals as well as the young. Damashek and Schwartz[1] state that splenectomy may be a very serious operation in elderly people. Forty cases in which splenectomy was performed in elderly individuals are reviewed, with 35 of the cases taken from the literature and 5 from my own observations.

Splenectomy was performed for the following conditions: (1) acute hemolytic anemia, 18 cases; (2) refractory hemolytic anemia, 3 cases; (3) primary splenic panhemotopenia, 6 cases; (4) acute splenic neutropenia, 6 cases; (5) chronic splenic neutropenia, 2 cases; (6) Felty's syndrome, 2 cases; (7) aleucemic leucemia, 1 case; and (8) unknown etiology, 2 cases.

The ages represented in the series ranged from 50 to 87 years. There were 13 cases in the fifties, 12 in the sixties. The sex of the individuals was listed in only 30 cases (see Table I) and in this group there were 15 women and 15 men.

HEMOLYTIC JAUNDICE

JAMES and Evans[2] reviewed the literature in regard to splenectomy for acute hemolytic anemia in individuals 50 years of age or older and found 15 cases reported, including one of their own patients. Two of these had passed their seventieth birthday at the time of the onset. Of the 15, five showed definite improvement after splenectomy. These five comprised the two over 70 years of age, one in the sixties and two in the fifties. In 10 of the patients, splenectomy was therapeutically ineffective and did not alter the downhill course. One patient died of congestive cardiac failure 36 hours post-operatively. Four died operative deaths. The ages of these patients ranged from 50 to 64. In 6 of the 10 fatal cases, the primary cause of death was found to be closely related to the operative procedure. In three, the blood dyscrasia was primarily the cause. Mason[3] reported 3 cases of acute hemolytic anemia, 2 women, aged 55 and 64 respectively, and one male aged 67. The 2 women did very well, but the man died later from hyperthrombocytosis. Sharpe and Tollman[4] reported 3 cases of refractory hemolytic anemia in which splenectomy was performed. Two were females, 58 and 60 years of age, and one was a male of 61. One female did very well; the one, aged 60, died 16 months later after a cholecystectomy. The male, who had refused operation 6 months before, died 5 days post-operatively. Sharpe[5] recommends

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splenectomy in cases with active clinical manifestations with or without complications, irrespective of age.

In this group of 21 cases there were 12 deaths, a mortality of 57 per cent. The sex of only 11 cases was listed, 7 of which were females and 4 were males. In this latter group there were 2 deaths, both males. Though this group of cases is small, it would appear that splenectomy performed in elderly people for hemolytic jaundice is attended by a very definite risk.

SPLENIC PANHEMOTOPENIA

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Doan and Wright[6] described 3 cases in which all the circulating blood elements were depressed. One of the cases, they believed, was congenital in origin and the other two secondarily acquired. They ascribed the depression of the peripheral blood elements to splenic dysfunction, with possibly the marrow modifying and contributing to the altered peripheral blood picture. They believe that a hyperplasia of the highly phagocytic R. E. tissue in the spleen occurs, with abnormal clasmatocytosis, and selective or total sequestration. Splenectomy results in a cure with re-equilibration of the peripheral blood elements to normal levels. Dameshek[7] believes that the spleen inhibits marrow maturation and production in contrast to the contention that there is a R. E. cell hyperplasia with increased phagocytosis. Dameshek and Estran[8] described a case in a male, aged 55, in which splenectomy resulted in a cure. Tanna[9] described a case in a female, aged 56, due to splenic fibrosis, in which splenectomy proved to be beneficial. Levy and Pizzolato[10] described a case of panhemotopenia in a male, aged 64, under the title of "Hypoplastic Anemia." Splenectomy resulted in an uneventful recovery, although the red blood cell count never returned to normal levels and they doubted whether the spleen played a major role. The author has observed 3 cases, one, aged 62, that had been diagnosed as aplastic anemia for a period of 10 years and had received over two hundred transfusions during that period. He was a wood worker and there was a history of exposure to benzene for many years. Examination of his peripheral blood revealed a marked anemia, a less well-marked leukopenia and only a slight thrombopenia. Sternal marrow aspirations showed a hypoplasia of all elements. There was a slight splenomegaly. It was felt that this was not a true aplastic anemia but possibly more closely related to Doan and Wright's cases of panhemotopenia. Splenectomy was performed and all the blood values subsequently returned to normal. Twelve months later the patient was alive, well and working again for the first time in 10 years.

The second case was that of a female aged 78. On admission she was acutely ill. All the peripheral blood elements were depressed and their totals were diminishing daily. There was a marked splenomegaly dating back seven years, but never a history of anemia. The blood changes were sudden in onset and rapidly progressive. Splenectomy was performed on the tenth

TABLE I
ANALYSIS OF 30 SPLENECTOMY CASES

Case history	Sex	Age	Author	Condition	Results of splenectomy
1	F	70	James & Evans[2]	Acute hemolytic jaundice	Alive, well 8 months later
2	F	75	Manelbaum[2]	" " "	Excellent recovery
3	F	60	Davidson & Fullerton[2]	" " "	" "
4	M	57	Israels & Wilkinson[2]	" " "	" "
5	F	55	Mason[3]	" " "	" "
6	F	64	Mason[3]	" " "	" "
7	M	67	Mason[3]	" " "	Died 5 days later from hyperthrombocytosis
8	M	52	East[2]	Acute hemolytic jaundice	Excellent recovery
9	F	58	Sharpe & Tollman[4]	Refractory hemolytic jaundice	Good recovery
10	F	60	Sharpe & Tollman[4]	" " "	Good recovery
11	M	61	Sharpe & Tollman[4]	" " "	Died 5 days post-operatively.
12	M	64	Levy & Pizzolato[10]	Secondary acquired splenic panhemotopenia	Good recovery
13	M	62	Author	" " "	Good. Patient alive & working 12 mo. later.
14	F	77	Author	" " "	Alive, well, 1 year later.
15	M	63	Author	" " "	Course unaltered, died 5 days later.
16	F	56	Tanna[9]	" " "	Good recovery
17	M	55	Dameshek & Estren[8]	" " "	Good recovery
18	M	87	Author	Acute splenic neutropenia	Died 1 year later due to pneumonia.
19	F	59	Salzer, Ransohoff & Blatt[15]	" " "	Good recovery
20	F	60	Rogers & Hall[13]	" " "	" "
21	M	52	Smith & McCabe[17]	Primary splenic neutropenia (acute)	" "
22	M	55	Kinsey & Bingham[16]	" " " "	" "
23	F	59	Smith & McCabe[17]	" " " "	" "
24	F	67	Wiseman & Doan[12]	Primary splenic neutropenia (chronic)	" "
25	M	56	Langston & Ashley[11]	" " " "	" "
26	F	50	Hanrahan & Miller[20]	Felty's syndrome	Arthritic and blood picture improved 5 months later.
27	F	71	Holland[21]	" "	Arthritic and blood picture improved 5 months later.
28	M	66	Tanna[18]	Aleucemic leucemia	Alive 2 mos. later—no further follow-up.
29	F	52	Tanna[18]	Unknown etiology	Left hospital alive, well. No follow-up. Pathology report congestive splenomegaly.
30	M	65	Author	" "	Left hospital alive, well. Later blood picture of pernicious anemia.

day after admission and though the post-operative course was stormy the patient survived. She has been well for over 12 months, although her blood values are still below normal levels. It was felt that this was a case of acute secondary panhemotopenia. The pathologic diagnosis of the spleen was "congestive splenomegaly."

The third case was that of a male, aged 64, who had complained of a bleeding and bruising tendency for a period of three years. He was admitted to the hospital bleeding from all orifices, and his skin was covered by petechiae and hematomata. Examination of his peripheral blood revealed a marked depression of all elements with a total absence of platelets. The bone marrow was hyperplastic, the megalocytes scarce, immature, non-granular and predominately in the blast stage. Transfusions were of no avail and splenectomy was performed. At no time after the operation were any platelets seen and death occurred 5 days later. The post-mortem findings revealed massive hemorrhage in all parts of the body. This case, it was felt, was one of splenic panhemotopenia in which the thrombopenia was the accentuated feature.

Of the 6 cases, 4 were in males and 2 in females. The ages ranged from 55 to 78. One death occurred, namely, in the last case reviewed.

PRIMARY SPLENIC NEUTROPENIA

In 1939, Wiseman and Doan[11] described a new syndrome in which the spleen pathologically segregates and destroys leukocytes instead of red cells or platelets. The outstanding features of this disease are splenomegaly, myeloid hyperplasia in the bone marrow, an absolute neutropenia in the peripheral blood and finally the prompt re-establishment of a normal peripheral white cell count following splenectomy. They reported 3 cases in 1939 and 5 in 1942 which resulted in cures. Following these, many more reports swelled the literature including 8 instances in elderly people, 4 women and 4 men, treated successfully by splenectomy. In the series compiled by Wiseman and Doan[12] in 1942, one of their cases was a woman aged 67. Rogers and Hall[13] reported a case in a female aged 60. Langston, White and Ashley[14] reported the case of a male aged 56. Salzer, Ransohoff and Blatt[15] described a case in a female aged 59. Kinsey and Bingham[16] reported a primary splenic neutropenia in a male aged 55. Smith and McCabe[17] reported two instances, one in a female, aged 59, and one in a male aged 52. I have seen one instance in a male aged 87. Splenectomy resulted in a cure that lasted eight months. At that time the patient developed pneumonia and died. In all of this group of eight, there were no deaths. From this small series it would appear that the post-splenectomy mortality in elderly people for this condition may be low.

UNKNOWN ETIOLOGY

Two cases[18] are listed that were submitted to splenectomy without a previous diagnosis. Both had large spleens and were splenectomized when exploratory operations revealed large, somewhat fibrotic, spleens. It is my belief and one

shared by most men interested in the subject, that very careful hemotologic studies should precede splenectomy. Lahey[18A] believes that if one cannot arrive at a diagnosis and if after six months of observation the spleen enlarges or remains unchanged and the cause is still unknown, it should be removed.

ALEUCEMIC LEUCEMIA

Tanna[18] described a case in a male, aged 66, in which the diagnosis was only made after splenectomy. The patient was alive and well two months later. There was no further follow-up. Tanna stated that if the diagnosis had been made pre-operatively the patient would not have been submitted to splenectomy. It is generally accepted that splenectomy is contraindicated in this condition.

FELTY'S SYNDROME

Felty[19] first described the condition in 1924. Polyarthritis of the atrophic variety, fever, secondary anemia, leukopenia, splenomegaly and tachycardia were the outstanding features. Hanrahan and Miller[20] described a case in a woman, aged 50, who benefited from splenectomy. Holland[21] described a case in a female aged 71. An excellent result was obtained by splenectomy. Most observers agree that the arthritic changes go unimproved but splenectomy will benefit the blood changes. Deductions as to sex distribution and mortality are impossible from so small a number of cases.

DISCUSSION

The series of cases discussed is too small for statistical conclusions and only an impression can be drawn from them. Blood diseases involving the spleen appear to affect elderly males and females equally. The highest mortality rates for splenectomy in the aged are in cases of acute hemolytic anemia. However, it would seem in the face of the failure of blood transfusion to halt the course of the disease that splenectomy should be resorted to. In the other diseases discussed, there were fewer fatalities. One might conclude that the prognosis is better in splenectomy performed for these conditions. In the splenic neutropenias and panhemotopenias, the progress of the disease in the acute form may be so rapid that the need for splenectomy here may be likened to the need for quick intervention in acute appendicitis. In Felty's syndrome splenectomy only alters the blood values and not the bone changes. Tanna states definitely that splenectomy is contraindicated in aleucemic leucemia.

SUMMARY

1. A review of 40 cases of splenectomy performed for blood dyscrasias is given.
2. The conditions for which splenectomy was performed are listed.
3. The age and sex distribution is briefly discussed.

4. Splenectomy for acute hemolytic jaundice, splenic panhematopenia, splenic neutropenia, Felty's syndrome and aleucemic leucemia in the aged is reviewed.
5. It would appear that the highest mortality in splenectomy in elderly people is obtained in acute hemolytic jaundice.
6. The overall mortality for splenectomy in elderly people is higher but when all other therapeutic measures fail splenectomy should be resorted to.
7. Aleucemic leucemia is not an indication for splenectomy at any age.
8. Patients should not be submitted to splenectomy without a thorough clinical evaluation.

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Psychology in Everyday Geriatrics

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PSYCHOLOGY is still regarded as a step-child in everyday geriatric practice, although it has been of special concern to modern geriatrists (Boas,[1] Kaplan,[2] Stieglitz,[3] Thewlis,[4]) and to some psychologists (Lawton[5]). The reasons for this are discussed elsewhere.[6]

If the causes of an elderly patient's complaints are undetermined, we are rather inclined to look for somatic rather than the possible psychological factors. It is true that psychological or mental disturbances may be ascribed to somatic conditions more often in the advanced than in the younger years. Vitamin deficiency may cause mental changes; arteriosclerosis, stubbornness and inflexibility, faulty habits, weakness, and so on. Making a diagnosis of organic disease or semi-disease in an elderly patient is easy enough but paving a way into his psychology is very difficult. There is a natural tendency, therefore, to accept the somatic diagnosis as the only explanation of his status.

SHOULD the doctor nevertheless decide to make psychological explorations, he has many difficulties to overcome. Psychological exploration requires time —with elderly patients a great deal of time—and a large reservoir of patience.

Sometimes it might seem that time could be saved by getting information from relatives, friends, neighbors, or associates. Information obtained in this way is of value but is often very one-sided. Too often the elderly patient, especially one from a middle- or lower-class environment, is objectively a burden. The family will seldom admit this, but subconsciously there will be tension based on the conflict between moral obligations and rejection of the burden imposed upon them.

THE MANIFESTATIONS of the conflict vary in nature and are often contradictory. They may emerge in various forms—open aggressiveness, over-anxiousness, over-protectiveness, sometimes as loss of confidence. A daughter's over-anxious attitude, for example, may be a camouflage for actually unfriendly feelings toward her sick, demanding, and burdensome mother. A worrying husband may basically mistrust and be hostile to his neurotic and dominating wife. Interpretations and conceptions often replace objective description, and the patient's complaints are presented by family members in a misleading and highly subjective way. The real causes of the elderly person's psychological difficulties remain, therefore, unrecognized and therefore

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neglected. We cite the following history as an illustration that psychological factors are often instrumental in causing symptoms which are commonly ascribed to purely organic conditions:

Case 1. Mrs. X., age 86, under care for approximately five years, suffering from esophagus diverticulum with apparently no malignancy. An intelligent, bright person, with no mental changes noticed except minor memory defects and a certain slowness and lack of flexibility. For the past 15 years she has been living with the family of her daughter, age 54. Although the relationship between daughter and patient appeared hearty, the patient was resentful and felt that not enough attention was paid her.

The daughter had a full-time job, had a middle-class household to manage, and was active in many fields. At 45, she had entered college as a student and was graduated two or three years later. She was obviously not able to devote too much time to her mother, although her household was well organized and she tried to make the mother's life as pleasant as possible.

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A blow struck when the daughter had to take a trip to Europe, and the patient was left in the care of a granddaughter, a college girl of 23 and the daughter of a deceased son. A few days later the patient started to vomit profusely apparently from the diverticulum. A new diet combined with the administration of sedatives, atropin, vitamins, and other drugs, offered no help. Psychological examination, however, revealed:

Since the granddaughter had to spend the bulk of her time at home, her friends visited her there, often passed by for a snack or for a talk, and once had a real party, with music and dancing. According to the girl, her guests tried to be as quiet as possible; according to the grandmother, their noise kept her from sleeping that night. A short time later the grandmother waited up for the girl who came in from a party much later than she had promised. Although the older woman reproached herself for being so much trouble to the girl, she was actually infuriated, felt more neglected than ever and blamed her daughter for leaving her with this granddaughter, with whom she had long been at odds. The girl, who felt rejected, asserted that her grandmother had never liked her because she resembled her mother, a daughter-in-law with whom the grandmother did not get along at all. Grandmother did not deny a preference for the girl's younger sister, who, she said, was more reliable.

SINCE the medical treatment was not successful, an attempt to improve the psychological condition had to be made. Arguments were avoided; full satisfaction was given to the patient's desires and habits. Although the girl was confined to the home, no friends were received and of course no further parties were given. A new tone in the everyday routine was introduced.

Because the condition of the vomiting and weakening patient made her unreceptive to psychological talks, I turned to the girl, whose cooperation had to be assured. This was, however, not so simple. The girl herself was a psychological case, and at this point a new man friend was involved in her already complicated situation.

By means of frank discussion the underlying factors of her own attitudes as well as those of the patient became more distinct. The fact that the arrange-

ments were to last for only three months was of definite help. The girl gradually became calmer, more self-controlled, and cooperative. As the girl regained equilibrium, the patient began to improve, and no further essential difficulties in swallowing were noticed. With the return of the patient's daughter, the status quo ante was restored. Now, seven months since the beginning of this episode, the patient is deteriorating with ulcerative and inflammatory processes of the esophagus. Antibiotics, chemicals, vitamins, and iron are being used. The psychological approach which proved effective in this case continues to be of definite value in the further plan of treatment.

THE FOLLOWING case may illustrate how deceiving a superficial acquaintance with environmental and psychological conditions can be.

Case 2. Mrs. E., age 84, under care since 1943. Diagnosis: severe vitamin B deficiency with atrophic glossitis, gingivitis, cheilosis, skin changes, constipation, neuralgia. Bilateral immature cataract. Patient is intelligent, interested in politics, reads her newspaper every day. Like most older people, she shows stubbornness and inflexibility. She is slow, impatient, and easily offended. She lives with her married daughter, age 50.

The daughter, who was present during my visits, showed interest in the patient, argued with her mildly, but only to insist on a more strict intake of medicine and on the necessity of improving the diet. The daughter resented the fact that her mother refused to take her meals with her and her husband. By implication it was understood that the daughter considered the patient stubborn, egotistic, and uncooperative.

The patient herself proved to be uncooperative, refused to accept injections, or to take her medicine regularly, and praised a downtown dispensary where she felt she had been well treated. The daughter, however, stressed that no dispensary could be better than a private doctor. Everything seemed to indicate the daughter's attitude was justified.

In the absence of her daughter, however, the patient was less reluctant to talk, and told a long story of friction between herself and her daughter. Patient felt that she needed medical care. The daughter, however, agreed to this only because of the pressure put on her, but it was only because it was inconvenient for her to accompany her mother to a downtown dispensary that she had asked me to visit the patient. The daughter did not believe in vitamin therapy and was especially opposed to injections because of the expense involved. The patient, an orthodox Jew, had to do her own shopping for food, have her own dishes, and prepare her meals herself, since she was not sure that her daughter would prepare the food according to the ritual laws. Under the circumstances it was quite understandable that patient could not take her meals with the family of her daughter.

After a period of active treatment the patient improved markedly. I have had rather a hard time with the daughter, but not with the patient, who has been cooperative and grateful.

THERE are two types of psychosomatic conditions in elderly patients. In one, as in the cases described above, somatic disturbances are obviously the prevailing factors. The psychic factor, although an important part of the whole picture, is secondary to the somatic condition. In such cases the

psychological components as an integral part of the psychosomatic syndrome may be easily overlooked.

In the second type, in which psychology is the prevailing factor, somatic conditions may easily be passed by. The temptation to treat patients with an anxiety neurosis, conversion hysteria, or hypochondria, who have been complaining all their lives of either pain, palpitation, nausea, or constipation, as psychological cases, even when they are somatically sick, is very great. In modern geriatrics it is acknowledged that although it is more or less safe to accept a single diagnosis in younger persons, in elderly patients it is to be expected that two or more diseases may be integral parts of the pathological condition. This likelihood should be extended to include psychosomatic diagnoses. Somatic conditions do not exclude strong psychological elements, just as psychological conditions do not exclude organic disease. As a matter of fact, the most baffling patients among our geriatric cases are the neurotic and the psychogenic ones. The probability that a neurotic elderly patient may acquire one of the numerous slowly developing chronic diseases of advanced life is at least as great as in so-called normal elderly individuals. If it is difficult to recognize an incipient pathological condition in the non-neurotic elderly person, one sometimes feels really lost in the tangle of symptoms in an old neuropath, where the psychic and somatic are interwoven, causes and effects completely confused, and, more so than in other cases, environmental factors tend to increase rather than clear up the general confusion.

The following two cases may serve as an illustration of this complexity of conditions.

Case 3. Mrs. S., age 65, under care for more than 15 years, suffering from anxiety neurosis with claustro- and agoraphobias. She has been a real handicap to her 67-year-old husband, a businessman, who has frequently been forced to cancel trips, meetings, appointments, to stay home with his wife. He had gained a certain degree of insight into her condition and in recent years was more often irritated and sometimes even openly aggressive.

One recent episode will be described. In November, 1947, patient began to complain of excruciating back and abdominal pains. No explanation could be found of her condition. Sedimentation rate and blood count were normal. Her subfebrile temperatures of 99.4° to 99.6° orally were not unusual for her and were attributed to her chronic throat condition. Restlessness, palpitation, sleepless nights for her and her husband accompanied her attacks. Neither codein phosphate (up to one grain every four hours), vitamin injections, or any other medication was of help and the rather slender patient lost about ten pounds in weight in less than one week.

The husband was definitely convinced that the condition was due to "nerves." He recalled that 25 years ago a similar episode had occurred and the pain was considered to be caused by a gynecological condition. On examination, however, the surgeon found no pathology and the patient was told that she was completely healthy. There was an instantaneous, spectacular change in the

patient's condition and she walked out of the office completely cured. Since no other explanation was found, I was inclined to accept a psychogenic origin of her pain. I started my psychological talks but encountered strong resistance.

Two days later the right diagnosis was made. The patient was found to have a herpes zoster covering the radicular distribution of D_{11}, D_{12}, and L_1. In addition to symptomatic treatment a psychological approach was strongly indicated but one which had to be based on other premises than the previous psychological talks.

The family physician is not infrequently drawn into psychological conditions of family life which are not what they appear at first glance. The inner causes of family conflicts are not always revealed from their outward manifestations. A harmless idea such as that held by husband in case 3 was rooted in a resentment of which he was of course not aware. The outer manifestation of this resentment was his misconception of his wife's reactions.

The physician must steel himself against such environmental influences and examine critically any psychological conceptions which come from the surroundings no matter how convincing they may appear. The next case demonstrates the difficulties of diagnosis in elderly neurotics.

Case 4. Mr. L., age 66, claimed to have been ill for the past 35 years. No doctor had been able to help him. I cite here a few statements from the more than thirty letters, prescriptions, electrocardiograms, and other data from various physicians in connection with the abdominal pain of which he had always complained: 1927: laparotomy performed; no abnormalities found. April 16, 1930: "Roentgen examination of the colon by opaque enema . . . reveals . . . no intrinsic pathology." January 30, 1939: thoroughly examined at a diagnostic service in one of the best known hospitals; conclusion: " . . . The clinical history and the essentially negative findings indicate that the abdominal symptoms are due to a purely functional disturbance of the gastrointestinal tract, associated with chronic constipation." October, 1946: X-ray examination: "Diverticulosis and diverticulitis of the proximal sigmoid" was found. In June, 1947, the patient entered the hospital for a thorough examination. There was a strong suspicion of a pulmonary malignancy, but there was no reason to repeat an X-ray of the colon which was taken seven months before. There were no changes in his abdominal condition. He continued to complain of "gas pain," belching, constipation, and so on. Since a thorough check-up had been decided upon, an opportunity was presented to repeat the X-ray examination of the abdomen. Here is the report of the X-ray examination: "Barium enema examination showed a constant irregular constriction in the sigmoid. The changes are most suggestive of a malignant lesion in this region . . . " Patient was operated upon and an incipient carcinoma, biopsy proven, was removed; no metastases were observed.

COMMENT

Four different cases were selected in order to demonstate various manifestations of psychological conditions in everyday geriatric practice. Somatic, psychological, and environmental factors were interwoven in each of these

cases. Both predominantly psychological and predominantly somatic cases were presented. In all of these cases the psychological as well as the somatic factors were important. The practical value of a psychological approach in a definitely organic case was shown in case 1.

It was not the purpose of this paper to go too deeply into the dynamics of mental processes of normal or sick elderly individuals, but rather to show the value of a knowledge of them and to stress the benefit one may derive from using appropriate psychological methods of treatment.

NEITHER the elderly patient himself nor his environment facilitates the task of the physician. The attitudes of both the patient and of those who are taking care of him are deceiving. The outer manifestations not infrequently hide the real feelings of the elderly patient. The 86-year-old Mrs. X (case 1) was full of sympathy and pity when talking of her daughter and granddaughter, but in reality she felt neglected and was resentful. The 84-year-old Mrs. E. (case 2) appeared at the beginning of treatment to be an asocial person who was creating difficulties for her family. Her stubbornness and inflexibility, which are traits generally accepted as typical in advanced life, could have been considered the cause of her attitude. The real causes of her psychological reactions were, however, of entirely different origin. She refused to take her meals with the rest of the family not because she was asocial, but because the daughter did not respect her religious feeling, and she resisted the medical treatment not because she was stubborn but because her daughter blamed her for incurring unnecessary expenses. Her stubbornness was certainly an expression of her impaired flexibility, but her opposition cannot be explained by her stubbornness. This opposition was the manifestation of her protest against her daughter's attitude. The stubbornness and inflexibility were parts of the framework of her character; the protest represented the contents of the psychological reaction and the exterior manifestation of this was her "asocial" attitude, which was by no means asocial.

In case 3 the noble attitude of the 67-year-old husband of the 65-year-old neurotic wife was that of a worried man. In reality he was aggressive and did not believe in his wife's pain, because basically he did not trust her.

WHEN we wish to gain insight into the real causes of a person's attitude we must have a satisfactory explanation of the motivation of his psychological reaction. It is not at all necessary to go deeply into inner mental processes. On the contrary, an examination of the everyday occurrences and their evaluation without prejudice is usually enough to reveal the basis for further psychological understanding. If, however, we accept as facts the information obtained from superficial talks with either the elderly patient or members of his family, we may get a distorted picture and an erroneous impression of the true psychological conditions.

We are often inclined to think that an elderly person is not able to give a coherent past history or a description of his actual condition. We are inclined to rely on the so-called objective information furnished by members

of the family or other persons who may be taking care of the patient. Cases 1, 2, and 3 showed how deceiving or misleading the anamnesis obtained from relatives can be. Of course if we are dealing with mental illness in an elderly person, the anamnesis obtained from relatives is of utmost importance. In all other cases, however, the elderly patient himself is the most reliable and expedient source of information, and only an anamnesis taken in the absence of another person is of value. Case 2 is instructive in this respect.

A past history obtained from the family may, however, be of significance from an entirely different angle. A comparison of the statements of both the patient and the relatives may help the doctor to become acquainted with conflicts. Discrepancies revealed by such a comparison may furnish insight into the real conditions existing among a family, in a foster home, or in a home for the aged which have in fact been thoroughly concealed by both sides.

If psychological factors can be underestimated by one of the parties (cases 1 and 2), they can also be overestimated by others (cases 3 and 4). To assume, in case 3, that the patient's pain was basically psychological or at least psychologically overlapped, was a mistake that might arise in dealing with old neurotics. In case 4 we saw an old hypochondriac with a complaint going back thirty-five years the functional character of whose abdominal pains was proven not only by numerous examinations but even by unnecessary surgical exploration. Nevertheless, in his sixty-sixth year we found an entirely changed condition—sigmoid carcinoma rather than a functional disturbance was the essential diagnostic problem. In this case to overlook a malignancy was much easier than to overlook the psychological difficulties.

In managing elderly neurotics we must be especially watchful. Thorough physical examinations must be performed more often rather than less often in such cases. Frequent examination based on knowledge of both psychological and somatic factors will in no way aggravate the neurosis. The emphasis, in treating such elderly patients, must be transferred from the psychological to the somatic components. This type of approach will help the physician to keep the condition under better control. For both the patient and his doctor it is the safer way.

Psychotherapy is as important in dealing with elderly patients as in dealing with other age groups. The methods to be used are, however, entirely different. If with younger individuals the main task is to help them adapt to environmental difficulties, it is the other way around with elderly patients—we must try to adapt the environment to them. In cases 1 and 2 the main task was to change the attitude and psychological approach of the members of the family toward the patient. The elderly patient himself we must treat as a mature person. It is necessary to clearly disavow the attitudes of other members of the family who consider the elderly person a childish and deteriorating creature. Where conflicts arise, especially in cases where we have little knowledge of the underlying factors, we must in the beginning blindly side with the elderly patient, or at least not make common cause with rela-

tives or supervisors. In the majority of cases our attitude will be justified. There will always be time to correct our mistake if it should become necessary. In the meantime we will have had an opportunity to establish better contact with the patient and gain an insight into the environment.

The psychological or psychosomatic approach to an elderly person requires from the doctor much more time than he usually spends with his patients. The medical answer is simple: If the medical profession is convinced that this approach is a desirable one, then time must be found. The sociological and economic aspects of the problem are, however, much more complex. For an answer we must go to other branches of gerontology and to sociology.

SUMMARY

1. Psychological problems in everyday geriatrics and difficulties in the way of recognition of them have been discussed.
2. The exterior of the elderly patient and a superficial impression concerning his environmental condition may be deceiving.
3. It is easy to overlook somatic conditions in elderly neurotic and psychological conditions in somatic cases.
4. Psychology is often instrumental in producing symptoms commonly ascribed to purely organic conditions. The psychological approach in such cases may be of therapeutic value.
5. A knowledge of inner mental processes of the elderly and of the underlying factors of his environmental conditions is necessary in order to build up an appropriate therapy.
6. The psychotherapeutic approach in dealing with persons of advanced age must be based on different principles than when dealing with younger age groups. The principles of this treatment have been outlined.

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GERIATRICS

Official Journal of the
American Geriatrics Society

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What is "Normal Senility"?

It is generally understood that senescence is normal aging and senility is an abnormal process. The Oxford dictionary defines senile as "now only of diseases, etc.: Peculiar to the aged." There are centenarians who enjoy normal senescence. Unfortunately, they are exceptions to the rule. If we attempt to study them, we may find that they have survived in spite of excesses, poor diets, etc. What does that prove? That the fittest survive. Such people, however, do not help to discover the causes of aging in which the average person is interested.

Ivan Basylewicz's *Centenarians: The Syndrome of Normal Senility* (*Rhode Island Medical Journal 32*: 315, 1949) deals with a collection of 72 nonagenarians and centenarians. He studied their aging processes and found that in most of these people medical examination did not show any symptoms of infirmity. One striking thing about the article is that the heredity of those studied was quite favorable. There were many instances of longevity in other members of their families. These people showed practically no changes due to age, even their rib cartilages, except the first pair, were not calcified. In this country it is difficult to find such persons past the age of 50.

There was no evidence of atherosclerosis nor arteriosclerosis in spite of hypercholesterolemia. This may mean that in this group the cholesterol remained in solution.

The only definite change noted in these patients was that the basal metabolism rate was markedly decreased. The author was of the opinion that the functions of the pituitary gland, thyroid and ovary showed definite weakening; this "exerted a great influence on the course of many vital processes in the aged body."

One striking part of the study described these patients as enjoying

mental and vegetative calm. There was also a decrease in the sensations of hunger and thirst with diminished consumption of food and water. This may be significant since undernutrition, especially in European countries during the war, may have had a beneficial effect and retarded the aging process.

Basylewicz concluded that 100-120 years should be the normal span of life. He noted that premature senility and premature death has been the rule. Therefore, one must try to prevent premature aging and resulting death.

A study of government statistics will show that there is increasing incidence of disease in advancing years. A study of autopsy records will show that a person past 50 often harbors several diseases. One must not be thrown off the track by a few old people who show no signs of aging for they are exceptions to the rule. Moreover, to form definite conclusions one needs sounder premises than the observations of 72 patients.

MALFORD W. THEWLIS, M.D.

The Terms "Geriatrics" and "Gerontology"

ALL LANGUAGE DEVELOPMENT is an evolutionary process; the spoken word usually antedates the written use. One does not need to be an H. L. Mencken to sense the word coinage that is current even to the extent of flagrant and obvious counterfeiting. Few doctors today retain more than a reference contact with the classical Greek and Latin despite the contributions they have made to our scientific vernacular.

Any "ology" (*logos*) connotes studies or investigations, as for example osteology or immunology. Thus, linked up with *geron* or "old man" we have literally the combination that seems to be a study of *old men*. However, Dorland's dictionary juxtaposes the definition of a *gerontologist* as "one specializing in the diseases of old age." The same book juggles the root "iatrics," healing from *iatrikos*, "the work of a healer in the department of medicine dealing with physical disabilities among the aging and the aged." This would make it appear that the terms "geriatric" and "gerontology" are neither distinctive nor exact. As a matter of fact, Stieglitz and others have well established in evolutionary sequence, a clear distinction of *care of the aged* for the field of geriatrics and a *study of the aging process* for gerontology.

This pragmatic decision will not suit linguistic athletes who agree with Tallyrand that "language was given to man wherewith to conceal his thoughts." A recent quote from Morris Fishbein in the Lancet (London) amply illustrates the variety of translations competent teachers of the classics toss out. It seems that a judicious obstetrician, wishing to put a motto over the door of the delivery room, hit upon *"Primum Non Nocere"* as suitable, but to be doubly certain he submitted it for translation to some of his friends, professors of the classics. He was told by one that it means "do not harm"; by another it could also mean "don't be naughty in the first place"; finally a third agreed with the two gentlemen but added on his own that it could mean "there is no harm in doing it once."

Gerontology will offer more and more in such terms of life and growth, probing the linkage of physics with biology. Geriatrics will continue on a more mundane sphere but cannot long divorce itself from the social and economic factors that challenge our living standards and, indeed, civilization itself.

E. L. TUOHY, M. D.

*Socio*medical Progress

In recognition of the close interrelationships between sociological and medical problems in the aged and aging, this section is devoted to constructive correlation of the respective viewpoints.

The Essential Partnership of Medicine and Social Work

Ollie A. Randall

IT SEEMS obvious that medicine and social work must establish a partnership, functioning actively for each of the disciplines party to it, if the elderly patient or individual is to have the full benefit of their common knowledge. Yet it is impossible not to be struck occasionally by the lack of recognition of the role which the social situation, if not the social worker, plays in the management of an old person's health.

Historically it has been the cooperative working relationship between members of the medical profession and members of other scientific groups such as sanitary engineers, physicists, and chemists which has resulted in the present controls of infectious and contagious diseases, as well as certain acute forms of illness. In these common endeavors there have been efforts to develop controls which would benefit the health of the masses, as well as improve the situation of the individual patient. It therefore seems rational to consider the effect which the tremendous change in the social environment of older persons has upon their personal health and upon the public health. Unless older people, now constituting a large proportion of almost any community, are physically, emotionally and mentally healthy, the general level of community health suffers. That society is notably dilatory in establishing appropriate measures for coping with the results of scientific advances is axiomatic. No more dramatic examples of this can be found than those which typify almost any phase of the social provisions, or lack of them, for our older people. In considering the illness or even the health of an older person, the social factors, which determine oftentimes both *what* he can do and *how* he can do, must be weighed as seriously and as carefully as the physical factors.

An episode at a conference held a short time ago in New York illustrates this point. Hospital needs were discussed, and there was agreement among representatives of both the voluntary and the municipal hospitals that the groups offering the greatest problems in the way of sufficient and suitable hospital accommodations were the tuberculous and the chronically ill patients. In the interchange of comments Dr. George Baehr, former president of the Academy of Medicine of New York, said he had recently made rounds in several hospital wards and was much impressed by the fact that in one ward there was no patient under the age of 45; in another, no patient under 60; and in still a third, no patient under the

age of 70. These older patients are admitted to the hospital, receive treatment, and are discharged, returning to their miserable or inadequate homes, only to come back again and again, because they cannot manage to improve or even to maintain the level of health at which they were discharged. And he added, " 'Geriatrics' is *not* a special branch of medicine—it is medicine applied to the treatment of disease as it occurs in older people. In reality it is *social medicine.*" Dr. Baehr was emphasizing that in the practice of medicine with older people there can be no arbitrary separation of the person or patient from his social environment, if the maximum or optimal measure of health is to be attained or maintained. This is true to some extent for patients of all ages, but for older people who have less opportunity and possibly less ability to control the external circumstances of their living arrangements, it is nearly always true.

Dr. E. J. Stieglitz points out that today clinical medicine must have its primary focus on "the individual rather than the diseases which beset him" and that "the person must be treated, not his illnesses," whether it is physical or mental health which is the concern. "Social medicine, on the other hand," to quote him further, "is concerned with man as a member of society."* This, in a broad and comprehensive sense, is the sound interpretation of the new concept of the science of medicine. However, for the purposes of this paper a somewhat narrower interpretation may serve—one which is predicated upon the desirability of partnership *through the exchange of skills and knowledge* between the physician, who is apt to limit his work to the clinical aspects of the case, and the social worker, who must deal with the social adjustment of the patient and often that of his family.

Social workers are increasingly conscious of the need for help from the physician in understanding the implications, for the patient and for their own approach to him, of a diagnosis in terms of physical health. They are also becoming aware of the significance of disease as a determining element in the individual's personality structure and his reaction to social and economic demands—although this is less often the case in their work with older people than with younger adults and children. Members of the medical profession are responding with less reluctance than formerly to requests for medical guidance from social workers in services with children. Even here the teamwork between the two groups is at best very spotty, and in all probability is usually initiated by the social worker reaching out for all the facts and assistance possible which can be useful in helping the client to help himself. It is probably treading on dangerous ground to venture the opinion that in the care of older people the amount and degree of voluntary teamwork between the two professions is negligible, for *neither* profession has as yet tilled widely or deeply enough in the field of geriatrics to have acquired substantial experience. Social workers as well as doctors function under a handicap which in many instances prevents their serving the best interests of the elderly client—the preconceived notion that all old people are sick anyway, and that old age is a period of progressive ill health. The physician's usual contact with disease in the elderly, whether in medical school or with patients who are paying well for their care, has been as indifferent or casual as that of the social worker. In few cases there has been a strong desire for better understanding either on the part of the social worker or the doctor.

Today, however, there is a deepening sense of the inter-relationship of the two disciplines. Current studies and programs, based on work with the patient in his own home (where the greater majority of older people will continue to be, not only because they *must* remain there, but because they wish to do so and because it is now

*Stieglitz, E. J., in Social Medicine: Its Derivations and Objectives: 76-89, Commonwealth Fund, 1949.

being proved it is the *best* place for them, given certain conditions), are attracting the attention of both professions. Doctors and social workers are being challenged to re-examine their established procedures, since these must be used in the new settings and situations replacing the social institutions considered essential in the early years of the twentieth century.

The Syracuse Study of follow-up care in the home after discharge from the hospital demonstrated, according to one of the physicians, that most of the social workers needed much more medical orientation and knowledge than they started out with. But, as a prominent social-work leader reminded the doctor, the participating physicians also realized they needed much more social orientation than they had received in their medical training or practice. The several home medical care programs now being conducted in New York, such as that at Montefiore Hospital and in the New York City Department of Hospitals, indicate conclusively the educational as well as the service value of such programs. As one of the medical men put it, "What I have learned about the home situations of patients, and the part the home and the family can play either favorably or unfavorably in their treatment, is extremely valuable. I have also come to realize that for some chronically ill patients and for many older people, the social worker is more essential in effecting treatment and improvement of the patient's condition than is the doctor. For practically all patients in this program she is *just* as important to the patient, and if he is a wise man, is always important to the doctor!"

This development, with the extension of medical care and auxiliary social services to the home of the patient as a substitute for the institutional or hospital care (which simply does not exist for elderly infirm persons) is further indisputable evidence that man-made institutions can be modified or adapted by man in the extremity of his need. In this search for methods of working with the difficult medical and social problem of the chronically ill and the infirm aged may come the strengthening of the teamwork between the two professions as a new benefit to everyone concerned.

Most of us who have spent much time with older people, either as individuals or as professional workers, are conscious of the painful readjustment which most of this group have had to make in a society so completely unprepared for their continued presence on earth. If their lot is to be improved—and with it the lot of us who will take their places sooner than we would like—then there must be immediate and intelligent planning for education in the schools of both medicine and of social work. This planning must inevitably map out the interdependence of the two professions. Possibly social workers could have medical men give them their orientation courses, and medical students could have social workers in a similar capacity. There must be clear and definite emphasis upon the fact that a person in his old age tends to suffer greater social and health losses than at any other time, and that those losses tend likewise to be less compensable then than at any other period of his life. This implies that, first of all, both the doctor and the social worker must be taught to find the individual old person —not just the disease, or the patient, or the socially dislocated person—and that, after finding him, they must be willing to endow him in their own minds with those perquisites which make for status and which merit the best which each profession has to offer. This also implies that the medical man must be willing to recognize the social worker in the hierarchy of the disciplines, and to accord to her or him the place which the *individual situation* may call for. All of us are accustomed to the attitude which consigns the social worker in the hospital setting to a kind of clerical or nuisance role, or to one getting less attention than either of these, in working out the total situation of the patient. Education of the social

worker as to how and when to use her skills and how to assume the role for which she is trained and equipped, and of the doctors as to the potentiality of her services for the good of the patient, will ultimately produce the kind of partnership without which, in this complex world, we cannot expect older people as patients to adjust.

If the doctor's only experience with social workers is that acquired in the hospital setting in which the major burden of treatment, as well as of judgment or decision quite properly rests with him, then it is small wonder that there has been little or no progress in mutual handling of cases in the patient's own home, in which often the burden of judgment might more logically rest with the social worker. Here many of the social workers are under the spell of the superior knowledge which the doctor has of the human body and the ailments thereof, so that they have probably not felt free to question or to share with the doctor knowledge which might be of help. One classic example of this remains vividly in my memory. A physician told a little old lady of some 70 years, French by birth, that she could not expect to live more than a few days or weeks if she insisted on going daily to her work as a seamstress in a small shop. The diagnosis and prognosis were shared with us. The recommendation that work be discontinued was taken very seriously, although all of us who knew *her*, knew that giving up work, not the illness, was the real death sentence for her. However, every attempt was made to help carry out the doctor's orders, but to no avail. This little lady had set herself a goal—that of working to a certain point in order to repay some imagined debt of gratitude to the United States for what had been done for her. And in spite of illness and doctor's warnings and social worker's unhappy failure to satisfy the doctor, that little lady lived seven years, going to work almost constantly, sewing the finest seam one could imagine, meeting her daily quota regularly, and supporting herself to within a few days of her death by the work of her hands. In the search, or research, for the controls of chronic disease we may need to pay more attention to the personal and social factors, to the psychological "will to live"—that intangible something which defies definition, but which can, if detected, be used to advantage by both physician and social worker.

In another case, the patient was an elderly farmer who had suffered for many years from some form of hay fever and who had spent most of his life on the particular farm on which he was still living. It was found by the clinician that the difficulty could be overcome by the "simple" device of having the old man move away from his home to another part of the county. The statement was cavalier in its complete dismissal of the whole life experience of the old farmer. Does it not raise questions, not as to the cure, but as to the *simplicity* of achieving it? And does it not raise the further question as to whether perhaps the cure might prove worse than the disease? Does an old man move easily from his home place of many years standing?—or could it not be that continuing to endure the suffering might be "simpler" than making the move? Manipulation of environment often sounds practical and easy, as well as subject to more direct controls than bringing about inner or personal adjustments, until there is realization that the interdependence of the inner and outer environments makes cleavage between the two an impossibility. Perhaps the doctor was more aware of what was involved than the report indicated, but the use of the word "simple" to describe this step which has been such a major one for the hundreds of older people whom I have known made me suspicious that here it was the patient's disease, not the individual, that was being treated. In both these situations better understanding of both the medical and social factors was needed by everyone, including the patients.

Today we hear of dramatic examples

of return to some degree of self-service or employment by older patients, long condemned to helplessness by their own lack of motive or interest on the part of others. Not only are the new rehabilitation procedures exciting and stimulating in themselves, but they result in healthy attitudes in both patients and those working with them and create a new climate of opinion about old people and about old age. With the future locale for much of our work in the person's own home, some observations made during a medical study in England are exceedingly pertinent. The physician who visited old people in their modest homes found an amazing amount of what he called "auto-rehabilitation." Patients upon whom others depended or who refused to succumb to disabilities simply kept on going—a fact which demonstrated that their desire to continue living and doing was strong enough to overcome seriously crippling handicaps. The willingness of sick old people in hospitals and institutions to yield to frustrating handicaps may in some cases be attributed to the lack of a reason to get better there, may be lack of interest on the part of personnel, or friends, or family, lack of anything to do for themselves or for others, the lack of opportunity of going anywhere else even when able—with all the lacks adding up to a "what's the use" attitude. Both the doctor and the social worker, especially in those cases in which disease is not the dominant but rather a complicating element, need an understanding of the dislocations which have taken place in the social environment of the individual, as well as his physical, biological or pathological dislocation, a knowledge of how these may affect the person's inner being.

Given sufficient personal motivation the limitations imposed on the older persons by disease may often be discounted to the end that a very satisfying social adjustment is made. Providing social activities for the older patient and the opportunity for association with persons who take the time to talk with him and who assume, without question, his ability to take part—these are undoubtedly preventive mental health measures which have not yet been successfully isolated or defined. Psychological and physical needs appear capable of satisfaction through some of the same means, although obviously in varying degrees. As personal adjustment improves, there is a new capacity for accepting and dealing with the difficulties of the social environment, to the mutual benefit of the old person and of his family.

The ultimate objective of therapy is to restore the patient to the maximum of human dignity of which he is capable; the aim of the social treatment is to assist the individual in realizing as fully as possible his capacity as a person and as a member of society. With this common goal—to be attained through different skills and methods—partnership between medicine and social work is not only essential, it is inevitable.

Work with the aged has been Ollie A. Randall's special interest in the field of social service for a number of years. As consultant on services for the aged for the Community Service Society of New York, she has become an authority on the sociological problems presented by older persons, particularly where they relate to medical care.

Miss Randall is a past president of the New York State Conference on Social Work, and has served as consultant to the New York State Joint Legislative Committee on Problems of the Aged.

"Life with Grandpa"

Secure and purposeful living through the later years, a goal which few of America's elder citizens have been able to achieve, is emphasized as an important objective for the future in March of Time's educational film, "Life with Grandpa."

A review of the status of our aged population, which now numbers some eleven million and promises to exceed nineteen million within thirty years, indicates that a majority of oldsters are presented with difficult problems of economic security and emotional adjustment. Enforced retirement from employment, inadequate financial provision, undeveloped recreational and educational interests and loss of personal responsibility all contribute to the feelings of loneliness and uselessness experienced by too many older people.

The responsibility for remedying these situations so that the aged can look with some certainty toward growing old in peace of mind, in dignity and in security, must be met by all individuals through improved programs and attitudes.

"Life with Grandpa" is a 17-minute sound film prepared for educational purposes and is available to interested groups. Prints of the film may be obtained from March of Time, Forum Edition, 369 Lexington Avenue, New York 17, N. Y.

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*The Aged Guest in Your Home**

Here are ten suggestions to offer the family who must live with and adjust to an elderly person in the home. Urge them to:

First: Respect his privacy. Give him a place of his own and don't intrude upon him without the courtesy of asking his permission to enter.

Second: Provide an allowance for him. However small it may be, give it regularly and unobtrusively. A little money is a wonderful morale builder.

Third: Let him be useful. Assign some definite tasks and state exactly what is to be done and when. If the job isn't done perfectly, a little patience and a few suggestions will help.

Fourth: Ask his advice. Don't do it directly but suggest an answer to him. He will feel flattered that he is a person to be considered and consulted.

Fifth: Be kind and gracious to his friends. Let him entertain occasionally. When all preparations are completed, leave the house and stay away until his party is over.

Sixth: Make your wishes known to him. If you are having guests and wish to entertain without him, tell him tactfully a few days ahead. Be so nice to him that he will not feel unwanted.

Seventh: Remind him of occasions he would like to remember. Buy cards or small gifts, but let him do the addressing. He will feel a sense of accomplishment and will enjoy the thank you's he receives.

Eighth: Accept him as a person. Recognize that he too is making adjustments and try to understand his problems.

Ninth: Be firm about neatness and cleanliness. Make sure clean clothes and toilet articles are available, and compliment him when he looks immaculate.

Tenth: Try to like him. It's easy to love one of the family, but it may be difficult with someone else. If you can't love him, or even like him, then at least be gentle with him.

●

Cornell Program

An experimental program to determine the possible reciprocal advantages of joint studies between the social sciences and medical and nursing education begins shortly at Cornell University. The project is being carried on in cooperation with the Russell Sage Foundation.

*Condensed from an article by Elaine Arrowsmith. R.N. HYGEIA 27:758. 1949.

Living Through the Older Years. Proceedings of the Charles A. Fisher Memorial Institution on Aging. Edited by Tibbetts Clark. 1949. Ann Arbor: University of Michigan Press. 193 pp. $2.00

Dr. Fisher was interested in the preparation of adults for old age. He was interested in the productive leadership of older people. Before his untimely death, he helped to arrange for the experimental program on the problems of the aging.

This valuable volume contains a collection of addresses which were given on the occasion of a conference on the problems and adjustments in later maturity and old age. The basic theme appears to be how to live through the older years. To do so gracefully one must prepare for it during earlier life.

In the first chapter Prof. Ernest W. Burgess gives a comprehensive consideration of the growing problem of aging in terms of numbers and activities, social participation of older people, and personal and social adjustment.

In the second chapter, Prof. Carl V. Weller gives an excellent consideration on the Biologic Aspects of Aging. He takes up the dignity of aging and the potential contribution of older people.

Dr. Edward Stieglitz, in the chapter on the Personal Challenge of Aging, covers the ground in his usual thorough and investigative manner. He places upon the individual the primary responsibility for maintaining a healthy, functioning organism.

Wilma Donahue gives a scholarly review of Changes in Psychological Processes. She sees good reason for greater longevity of the cerebral functions.

Moses Frohlich covers a larger number of problems that affect the mental health of older people and of those associated with them. He takes up the problems of loss of job, decline in health, loss of close associates and friends. Preparation for old age is his prescription for adjustment.

Patricia M. Rabinovitz writes on Living Arrangements and takes up the problems of living with relatives, living alone, and living in institutions.

Prof. Leroy Waterman writing on Religion and Religious Observance says that more application of the Sermon on the Mount might solve many problems in everyday life.

Aging Creatively is expertly handled by George Lawton. Lawton's book *Aging Successfully* needs no introduction. He always has an important message. In this chapter, he considers creative activity for the aged, especially with hobbies.

The two chapters on Economic Problems of the Aging by Ewan Clague and Charles V. Kidd cover related problems of employment of older people and of the very complex economic problems of providing support for the aging. Kidd gives suggestions for broad revisions in government assistance and insurance plans.

Finally, Dr. Harry A. Overstreet makes an appeal for younger people to prepare for old age and for older people to live intelligent, active, creative and satisfying lives.

The book is important for everyone interested in the aging population.

MALFORD W. THEWLIS, M.D.

Outlines of Internal Medicine. Edited by C. J. Watson, M.D. In five parts. Sixth edition. 1949. Dubuque, Ia.: William C. Brown Co. Prices: Part I, $2.60; Part II, $1.95; Part III, $2.10; Part IV, $1.50; Part V, $1.85

The *Outlines of Internal Medicine* have been written by members of the faculty of the Medical School of the University of Minnesota and edited by the chief of the Department of Medicine. The outlines are used by junior and senior students as their text in medicine. Assigned readings of the outlines serve the purpose commonly designed for didactic lectures. Consequently time usually allowed for instruction by lecture may be used for demonstration and clinical teaching. By this pedagogical method, the head of the department, and each of the faculty, is aware of what the students are told about all subjects.

The Outlines are published in two formats: a set of 5 paper-covered, wire-bound volumes, convenient for student use; a single cloth-bound volume containing all 5 parts, suitable for reference and general reading.

Part I includes infectious diseases, pulmonary tuberculosis and other diseases of the lungs, allergic diseases and chronic rheumatoid disease.

Part II includes diseases of the blood; of the liver, biliary tract and pancreas; of the mouth, esophagus, stomach, duodenum, small intestine and colon.

Part III comprises lectures on heart failure; Bright's disease; electrocardiography; rheumatic fever and rheumatic heart disease; congenital heart disease; pericarditis; aortic stenosis; pulmonary arteriosclerosis; syphilis of the heart and aorta; hypertensive heart disease; arteriosclerosis of coronary arteries; cardiac arrythmias; and peripheral vascular diseases.

Part IV includes deficiency diseases; endocrine diseases; and diabetes mellitus.

Part V is a manual of clinical chemistry and microscopy.

The sixth edition of the *Outlines* has been done by offset printing, a method which permits comparatively easy correction and revision. A revised or new edition has been issued about every other year since the first writing in 1938. The material is presented in concise form without extensive historical or literary background, but, except for a few tabular outlines, in finished, readable style. Suggestions for collateral reading are appended to each major section. The loose-bound separate volumes have blank pages interpolated for student's notes.

The information given in the *Outlines* is authoritative and well seasoned, and, although planned for undergraduate students, could profitably be assimilated by any busy practitioner.

James B. Carey, M.D.

The Chicago-Cook County Health Survey. Conducted by the U. S. Public Health Service. 1949. New York: Columbia University Press. 1315 pp. $15.00

This is the first comprehensive analysis and appraisal of the health facilities of a large community—Chicago and Cook County, Illinois. This is a landmark in the evolution of cooperative community enterprises. It can easily be a guide to other large municipal areas. The principles can be applied to smaller areas. The work, under the direction of Knox E. Miller, covers all phases of health, both of public and voluntary agencies. It shows how each phase can be improved and how all should be coordinated and integrated into a dynamic harmony.

Individual chapters deal with water supply, sewage, refuse collections and disposals, milk supply, food dispensing establishments of all kinds, rodent control, housing, communicable disease control, mental hygiene, school health services, industrial health services, nursing services, and dental facilities. There are numerous statistical tables and numerous photographs.

Each chapter, written by an expert in the field, ends with comments and recommendations. An index of 35 pages indicates how many subjects are discussed.

There is an extensive study of the chronically ill. Twelve thousand additional beds are recommended for the Chicago area. This demonstrates the great need for more hospital beds throughout the country. In most instances the findings in this area are similar to those in others.

Some of the recommendations in the book will help to prevent chronic illness. It seems to me that the great need in the future is preventive medicine applied to the prevention of common diseases.

In this book one can obtain information on the improvement of health and prevention of illness. Prevention is implied where the causes of disease are discussed.

There are several pages devoted to the medical care of the aged. One of the most important considerations is that of nutrition. At present the nutrition service reaches only a few groups. As time goes on, no doubt this will be extended to greater numbers of the population.

This book could be read advantageously by all physicians.

Malford W. Thewlis, M.D.

Rehabilitation of the Handicapped. A symposium edited by William H. Soden. 1949. New York: The Ronald Press Company. 399 pp. $5.00

This is a symposium of thirty-eight articles intended "to assemble representative accounts of procedures in current use for the mental and physical rehabilitation of persons disabled by illness or injury or otherwise handicapped."

The editor, William H. Soden, is Executive Assistant in the Physical Medicine Rehabilitation Service at the Veterans' Administration Hospital, Northampton, Mass. His thesis is that the rehabilitation process should begin when the disability occurs and that it does not end until the disabled person is utilizing his limited abilities to the maximum.

Twenty-one of the articles are written by physicians who are specialists in the various medical phases of the process. Dr. Herman Seidel, Chief of Medicine at the Hebrew Home for the Aged and Infirm in Baltimore, Maryland, writing on "How to Grow Old Gracefully," emphasizes the need of continued physical and mental activitiy in older people. In simple terms he explains how the aging process may contribute unnecessarily through inactivity, to a progressive series of restrictions. The aging person, no longer an influence in the social and economic activities in which he played a role for so many years, develops social attitudes that affect his conduct toward others as well as respect for himself. He resents the treatment accorded him, becomes defiant, or assumes an attitude of futility and hopelessness.

A chapter on "Chronic Illness as a Public Problem," by William F. King, M.D., Director, Division of Adult Hygiene and Geriatrics, Indiana State Board of Health, presents objectives for their Division. In essence, they hope to learn more about senescence and the problems that are too frequenltly accepted as inevitable. They hope to acquaint the public with the problems of senility since, with an informed and understanding public, many of these problems might be prevented. Cooperation between the medical profession and public officials may lead to fuller appreciation of the value and usefulness of this increasingly important part of our population.

Other chapters of the book deal with the problems of specific groups of the disabled. The problems of the amputee, the tuberculous, the blind, and the palsied, frequently added to the general problem of old age, are treated by authorities in the respective specialties.

H. W. Gunnarson

DIGESTS *from Current Literature*

Physical Medicine in Disabilities of the Aged.

HAROLD DINKEN, M.D., *Arch. Phys. Med.*, 30:78-81, 1949.

After fifty, physical therapy must be given with due regard for slower metabolic and degeneration of tissue. Delayed healing, trophic skin changes, intolerance to heat, cold, and ultraviolet radiation, a tendency to contracture, muscular weakness, and other phenomena are taken into account.

Elderly people receive about one-third of the number of treatments given in a department of physical medicine. Harold Dinken, M.D., suggests the following procedures for the major disabilities observed.

Arthropathies. Either moist or dry heat is employed in the smallest effective dose. Paraffin, luminous or infrared rays, warm tub baths, or hot packs may be suitable. Treatment is followed by light effleurage and therapeutic exercise of passive, active assistive, active, or resistive type.

Bone, joint, or muscle trauma. Peripheral circulation should be increased, edema and contracture prevented, and motor function improved. Early activity is encouraged and long, debilitating inertia avoided.

Vascular lesions. For the old man or woman with hemiplegia, early motivation is essential. Pulley exercises, muscle reeducation, and training in gait are given with reference to everyday activities.

If an affected part cannot endure direct heat, the circulation may be stimulated by more distant application. Good reflex blood flow can be produced in the leg by insulating the extremity and warming the pelvic area.

Neuromuscular disorders. Suitable arts and crafts are invaluable aids to motor coordination, strength, and endurance. Occupational therapy also benefits senile psychoses.

With all types of disability the condition should be discussed in detail, and learning to live with the handicap urged. Since therapy should be more constant than is convenient for a busy department, the patient should adopt a home course of treatment and assume certain responsibilities for his own comfort.

Personality Factors in the Mental Disorders of Old Age.

JAMES W. AFFLECK, M.B., Ch. B., F.R.F.P.S., (Glas.) D.P.M., *The Medical Press*, 5765:422-424, 1949.

The aged patient must be regarded as an individual and a personality, not a "case" of senile dementia, paranoia, or any imaginary clinical entity. Actually senescent deterioration does not make the psychosis, according to James W. Affleck, M.B., of St. James Hospital in Leeds, England, but the patient's reaction to the deterioration or his reaction to the environmental strains of later life.

The old person often has more difficulty repressing the guilt and anxiety feelings, looking for an outlet from the unconscious mind. Complexes and neurotic symptoms overcome in earlier life renew their efforts to reach a place in the light of consciousness. Rarely does a neurosis occur for the first time after the age of 60.

The most significant proof of the effect of a previous personality in senile psychosis arises in consideration of physical pathology. Correlation between clinical history and brain pathology is not found frequently. Interpretation of senile psychosis in terms of organic disease cannot be made.

Heredity and previous adjustment are major factors in senescent mental health. Those with good personality must be encouraged, and those with poorer must be given freedom and appreciation of their value. Old people must be given the chance to maintain their self-esteem in work as long as possible.

Gallbladder Disease in the Aged.

EMANUEL W. LIPSCHUTZ, M.D., *Rev. Gastroenterol.* 16:629-634, 1949.

The incidence of cholelithiasis steadily increases with age. When uncomplicated, symptoms are similar in all age groups. However, Emanuel W. Lipschutz, M.D., points to associated diseases, sequelae and complications in the older patient that can make diagnosis and proper management more difficult.

The aged patient who has harbored gallbladder disease for thirty or forty years has a high morbidity. Complications may result in a carcinoma of the gallbladder or common duct, or in attacks of acute cholecystitis leading to a slow or acute perforation of the gallbladder causing an internal biliary fistula. A gallstone impaction may cause obstruction of the bowel or a calculous obstruction of the common duct.

A hiatus hernia or an epigastric hernia are often found in the aged gallbladder patient. Diabetes in the aged is frequently associated with hypercholesterolemia and cholelithiasis. Coincident disturbances in the cardiovascular-renal systems are common. Pain and tenderness in the right upper quadrant and a large tender liver indicating a congestive heart failure, may, in an elderly gallbladder patient, be erroneously diagnosed as acute cholecystitis and digitalis and mercurials withheld when most needed. Coronary occlusion, especially when posterior or when initiated with reflex vomiting, may be mistaken

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for gallstones, or vice versa. Distention of the gallbladder or common duct can alter the cardiac rhythm and rate. Positive electrocardiographic findings may follow a severe attack of biliary colic.

A bland, moderately high protein and low carbohydrate diet, supplemented with daily vitamins, is indicated. Some patients do not tolerate vitamins in cod liver or halibut oil. A mild laxative is often needed. Choleretics in 6-8 week courses, two or three times a year, is advisable, with antispasmodics and mild sedatives when needed. An acute gallbladder emergency with some degree of cardiac failure may require antibiotics or parenteral therapy. Smaller quantities of intravenous fluids given at slower rates, or fluids by hypodermoclysis only, help to avoid pulmonary edema. Surgical intervention, when necessary, is not contraindicated because of age.

The Role of Hypothermia in the Treatment of Vascular Lesions in Geriatric Patients.

ROBERT T. FOX, M.D., *J. Indiana M. A.*, 42:435-437, 1949.

Mortality rates may be cut by two-thirds with use of hypothermia in operative treatment of geriatric patients with vascular lesions. Robert T. Fox, M.D., found refrigeration of benefit in 52 patients, all over 65 years of age, admitted to Miami Valley Hospital for treatment of circulatory complications of the extremities.

Local applications of ice produce sufficient skin anesthesia for incision of abscesses, removal of nails and grafting of skin, but complete interruption of painful stimuli is necessary in amputation surgery. Stump complications, partially induced by poor development of collateral circulation, discourage use of the tourniquet.

If a two-tourniquet technic is adopted, the period of anesthesia is limited and a guillotine amputation must be employed.

Shaved ice is packed around the limb, which remains in this medium three hours for thigh amputation, two and one-half hours for leg. Pain produced by manipulation of neurovascular structures is abolished by injection intravenously of one-half to one grain of sodium pentothal 45 minutes after hypodermic administration of 1/150 gr. atropine sulphate. Postoperative narcosis is brief and nausea rare.

Instruments, saline and antiseptic solutions are chilled before operation. Division of skin, subcutaneous tissue and muscles begins during induction of sodium pentothal anesthesia which is discontinued once procedure is completed and vessels tied. Dermal insensitivity remains long enough to permit closure. Oxygen is administered with sodium pentothal.

Dangers are present but of comparative unimportance with ice therapy. Mild degenerative changes in branches of tibial and peroneal nerves of man have been observed by other writers.

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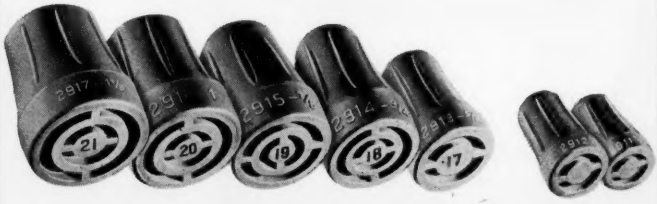

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The Endometrium in Old Age.

HAROLD SPEERT, M.D., *Surg. Gynec. and Obst.*, 89:551-558, 1949.

Atrophy is the normal condition of the asymptomatic postmenopausal endometrium. Harold Speert, M.D., of the University of Chicago, in a histologic study of 60 normal uteri removed from women aged 50 to 85 years, and 2 to 35 years beyond the menopause, found true hyperplasia in only 3 uteri, at least 2 of which had been subjected to medicinal sources of estrogenic stimulation. Previous studies, which have shown a surprisingly high incidence of hyperplasia, have been of women with gynecologic disorders, and many of the endometria were classified from examination of curettings.

In the present study endometrial polyps were present in 17 per cent and adenomyosis in 21 per cent. Routine sections of the uteri showed that in 72 per cent cystically dilated glands were present. These are the result of mechanical obstruction of the gland mouths and desquamation or secretion into their lumens. Cystically dilated glands are especially common in the endometrial polyps which occur in the postmenopausal period.

Changes in the stroma consisted chiefly of fibrosis and hyalinization, especially near the surface. The spiral arteriolar apparatus could not be demonstrated. These arteries, which supply the stratum functionalis of the human endometrium, atrophy rapidly after the menopause, probably because of diminution in circulating estrogen.

The veins of the senile uterus are thin-walled and often course through extremely superficial layers of the endometrium, sometimes being separated from the uterine cavity by only one or two layers of cells. Rupture of an expanding cystic gland underlying such a superficial vein might traumatize the vessel, producing a vaginal hemorrhage, the cause of which could not be determined through curettage.

Further Studies on Liver Function Tests in the Aged.

HENRY RAFSKY, M.D., F.A.C.P., and BERNARD NEWMAN, B.S., Ch. E., M.S. *Rev. Gastroenterol.* 16:783-785, 1949.

A subclinical state of liver impairment is common in elderly people. In a study of 42 subjects between the ages of 65 and 86, Herman Rafsky, M.D., and Bernard Newman, B.S., found laboratory evidence of hepatic dysfunction in 97 per cent of the cases. All were apparently normal individuals on an adequate diet. Of the 42 cases, all but one showed abnormality in at least one test, 11 cases showed hepatic dysfunction in two tests, 22 cases in three tests and 6 cases in four tests. Liver function tests used were the oral hippuric acid, cephalin flocculation, thymol turbidity, cholesterol partition and bromsulfalein tests. In a previous study of so-called normal individuals past 65 years, 86 per cent showed some laboratory evidence of liver impairment.

GERIATRICS

Medico-Legal Aspects Of Senescence

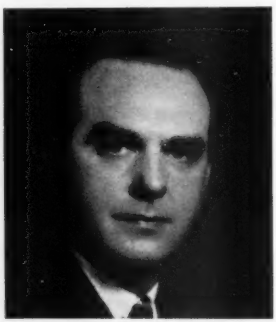
Harold W. Lovell, M.D.*

MEDICO-LEGAL PROBLEMS among older people are increasing. Since 1912 the admission rate of arteriosclerotic psychoses to public mental hospitals in New York state has increased more than six-fold. Approximately 20 per cent of first admissions to the civil state hospitals in this state are suffering from psychoses with cerebral arteriosclerosis, a percentage exceeded only by patients with schizophrenia, a group totaling 25 per cent.[1] When the considerable psychological changes occurring naturally in the aging process go beyond a relatively normal limit and enter the realm of confusion, delirium, and psychotic reactions, the law may become involved in a variety of ways. Senile and arteriosclerotic psychoses of the true types, resulting from degenerative cortical changes, are not reversible and therefore present a minimal problem. However, cases not diagnostically distinguishable from the true types yield under proper treatment a recovery rate of 25 per cent.[2] During an early or acute phase in either case, admission and detention of the patient in a licensed mental hospital or sanitarium may be necessary. The constitutional provision that "no person shall be deprived of his liberty without due process of law" necessitates recourse by the attending physician to legal measures for the further institutional care and treatment of his patients. Such mentally ill patients are usually unable or unwilling to enter or remain in hospitals and the law is invoked to hold them against their will.

THE LEGAL machinery applying in cases of this kind varies greatly among the different states and in many instances is archaic and cumbersome. Mental disease in some states is treated as though it were a crime. In one state, for example, a jury trial is required before a patient can be committed to a

*Associate in Neurology, Flower and Fifth Avenue Hospitals, New York City.

psychiatric hospital; in ten other states such a jury trial is optional with the presiding judge. In some states a warrant must be sworn out for the arrest of the patient who is brought before a court, and in others the judge may commit the patient to a hospital on his own initiative or on the testimony of examining physicians. In Florida, apparently to give assurance that a patient is not "railroaded" to a hospital by relatives, it is required that a petition for the commitment of an insane person must be signed by five reputable citizens, not more than one to be a relative. The sheriffs and their organizations, apparently because of the fees involved, fought recent attempts at a change in the California law which would permit nurses or attendants from the state institutions to take patients to hospitals, a duty formerly assigned to them.



HAROLD W. LOVELL, M.D.

Gradually, these antiquated attitudes and procedures are giving way to the more modern conception of mental disease as a medical illness, and laws are being enacted to facilitate the admission of mentally ill persons to hospitals for proper protection of their legal rights. The laws, as recently enacted in New York, are the most progressive to be found in any state and are an example to other states for adoption. As they may apply to the mental disorders of old age, a summary of the various procedures in the New York State Mental Hygiene Law enacted by the 1944-1945 legislature is as follows:

One act amends the mental hygiene law generally in relation to definitions, titles, and terms. For instance, the designation "mentally ill" is substituted for the words, "insane," "insanity," and "lunacy." A mentally ill person is now defined as "any person afflicted with mental disease to such an extent that he is incapable of managing himself or his affairs and for his own welfare or the welfare of others, or of the community, requires care and treatment."

Admission to a hospital for the mentally ill may be effected in one of several ways. So-called "voluntary" patients may enter such a hospital or licensed private sanitarium on their own application. Because of the usual character of mental disorders of the aged and the fact that hospitalization is ordinarily postponed beyond the time when it is possible or fair to expect the patient to assume responsibility for his "voluntary" entrance to a hospital, this form of admission is not ordinarily desirable. The previous requirement that such a voluntary patient could not be held more than ten days after he gave written notice to leave has been changed to a period of 15 days, *after* a preliminary period of 60 days of care and treatment. Elderly "voluntary" patients who are subject to relapses and remissions of their psychotic processes may present trying administrative problems by submitting a written

demand for release during a temporary remission only to relapse again before or shortly after dismissal from the hospital. The 15-day rule provides the hospital director with time to apprise the patient's interested relatives or others who may invoke the legal requisites of certification upon the hospital director's recommendation but without his participation. Neither the director nor any member of his medical staff may participate in the certification of a patient to any state or private hospital with which he is in any way affiliated.

A second method of admission to hospital is on the certificate of a health officer. Upon the written request of a health officer, any patient who needs immediate care and treatment because of mental derangement other than drug addiction or drunkenness, may be admitted and detained in the hospital for a period not to exceed 60 days. By the end of that period the patient must either be discharged, admitted as a voluntary patient, or certified.

One physician, designated a "qualified examiner" by the state department of mental hygiene, may on a certified petition certify to a state of private licensed institution any patient suitable for care and treatment, *but who does not object to treatment,* indicating that the patient is mentally ill. Such patient cannot be detained more than 60 days if he, or any person in his behalf, makes written request for release, unless the superintendent or physician in charge deems such detention necessary and so certifies to a court of record.

Under the new law, the court upon a certified petition and on the certificate of two qualified examiners whose examinations must be made simultaneously, does not *commit* the patient to an institution, but issues instead an order directing that such mentally ill person be admitted to a state or private licensed institution for the purpose of observation of such patient, this period not to exceed 60 days. It also provides that "at any time prior to the expiration of sixty days from the date of the order made as provided by this section, (Section 74), the director of the institution to which the patient has been admitted for observation, or a staff physician designated by the director, may, if he finds that said patient is in need of continued care and treatment, file in the office of the county clerk, a certificate setting forth his findings and the need for the continued care and treatment of such patient." Upon the filing of such certificate the order theretofore made by the judge shall become a final order and such patient shall thereafter remain in such institution, or any other institution to which he may be transferred, until his discharge in accordance with the provision of this chapter. With this statute, the tremendous responsibility devolving upon the hospital or sanitarium superintendent becomes obvious. It also emphasizes the need for efficient and well-trained state inspectors of all institutions for the protection and proper release of that recoverable group of 25 per cent of patients, who may not at the time of their confinement be diagnostically distinguishable from the uncomplicated cases of senile dementia or arteriosclerotic psychosis who usually require permanent hospitalization.

The new law provides for temporary care and observation up to 60 days

in the psychopathic department of any general hospital connected with a medical school and used for teaching medical students, or in the psychopathic department of any hospital maintained by any county in the state. After the expiration of the 60-day period, however, no patient shall be detained more than 15 days from and inclusive of the date of a notice in writing stating his intention or desire to leave.

The emergency admission of a mentally ill person to a state or licensed private institution is possible on an incomplete court order which requires a certified application, the certificate of two qualified examiners, and completion of the certification by a judge's order within 10 days. After the judge signs the order the patient may not be detained longer than 60 days unless prior to that time, the director or designated staff physician shall certify to the county clerk that the patient requires continued care and treatment.

To prevent the detention of mentally ill persons in nursing homes or other so-called hospitals which are not staffed or equipped to care for them properly, the law stipulates that "no mentally ill person shall be confined in any *other* place than a state hospital or licensed institution for more than sixty days." The time element may be altered in keeping with the usual provisions already referred to. The law specifically forbids the locking up or detention of mentally ill patients in jails or prisons. It also authorizes medical inspectors of the department of mental hygiene to enter and inspect any hospital or other place where it is alleged that mentally sick patients are detained and to order their release if improperly or illegally cared for or detained. All state and private licensed institutions for the mentally ill in New York state are regularly visited by the medical inspectors who are experienced psychiatrists. The medical inspector may order a patient to be discharged or a voluntary patient may be ordered to be certified. Any patient has the right to ask for and be granted a private interview with the inspector. All accidents to patients are reported to the department and investigated by the medical inspector.

A patient in any mental institution has a right to correspond with any judge or district attorney or any practicing attorney in New York state, and with the governor or any official of the department of mental hygiene, without hindrance and without inspection of the communications.

Persons in mental hospitals may carry out financial transactions and sign contracts, etc., if they are certified by the director of the institution to the department of mental hygiene as competent to do so and permission is granted by the department. A person in an institution cannot be sued or served with a summons and complaint except upon an order by a court, which order shows that the court knew that the person to be served was a patient in a mental institution.

The old law providing that notice of the application to be made to the court shall be served upon a patient not less than one day before the date of the application is continued. If the examining physicians certify that such

service upon the patient would be ineffective or detrimental, the court is required to dispense with personal service on the patient.

If a person who has been certified to a mental institution is actually incompetent to manage his own affairs and needs someone to take care of them for him, a special action needs to be brought for the appointment of a committee. If a patient has been certified to a state hospital, this is a comparatively simple procedure as the director of the institution makes an application to the court indicating that the patient has been certified as mentally ill, the attorney general acts as counsel for the hospital, the patient and relatives are served with a notice and are given an opportunity to be heard, and the judge then makes the decision about the appointment of a committee. If the committee appointed is one individual, he is required to give a bond for twice the amount of the patient's estate and to make an annual report of expenditures and income to the court, and is forbidden to sell or otherwise dispose of the incompetent's property without an order of the court. If, however, a mentally sick patient is in a private institution, application has to be made to the court, a jury summoned, evidence of the incompetency presented by doctors and others who know the patient, and a final decision rendered by the jury.

THE law provides that no person who is charged with crime shall be held guilty if at the time of the commission of crime he was in such "a state of idiocy, imbecility, or insanity as not to know the nature of the act and know that it was wrong." A person cannot be placed on trial on criminal charge if at the time of the trial he is in such a state of "idiocy, imbecility, or insanity as not to be able to consult with counsel and prepare a proper defense." Attorneys for a person charged with crime may make a plea of insanity for the client, and the judge may order the prisoner sent to a psychopathic institution for observation and report by two certified psychiatrists as to whether he is able to stand trial or consult with counsel. If the prisoner is in such a condition as to be unfit for trial, the judge may commit him to a hospital for the criminal insane to be held there until the director of that hospital certifies that he is recovered, when he is brought back to court and placed under trial. If, however, it appears that the prisoner was legally insane at the time of the commission of the crime, he may be acquitted on the grounds of insanity and discharged.

It is the duty of every doctor, as with every citizen, to testify when called upon by a court of law, regardless of any personal inconvenience. This duty may be enforced by a court writ or subpoena commanding him to appear and testify in a certain court in a certain cause and on a certain named day. There is some question whether the doctor may be compelled to testify as an expert in court without extra compensation, but in other respects he is no different from any other man and *must* respond when summoned regardless of professional engagements. With increasing numbers of old people, the doctor may expect to become increasingly involved with medico-legal problems.

When he is informed that he is to be a witness, he should prepare himself for the examination, should learn from the attorney what is expected of him and what his rights and privileges are. Theoretically and practically, the expert witness is there to advise the judge and jury of the scientific problems involved, and to help them apply the rules of science to the facts in the case. He can be of real value only if he can talk to the judge and jury in terms that they as laymen can understand. Unfortunately, in the average case, the medical testimony comes out in the form of a technical jargon that is almost completely unintelligible to the jury and which can be translated to them by the judge in his charge or by counsel in their arguments only if they themselves understand the language used. Never is this more true than when the intangibles of neuropsychiatric terminology are dealt with in court.

THE experienced doctor witness sometimes, and the inexperienced always, look forward to the cross-examination as an ordeal. Having heard or read so many stories of witnesses breaking down on cross-examination, he fears the same thing will happen to him. By way of reassurance to the doctor, I quote from legal authority of great experience in respect to cross-examination of the medical witness: "The more experience in the cross-examination of the medical witness and particularly the medical expert witness, the more one must come to the conclusion that the cross-examination of a truthful, honest, efficient, and capable medical expert witness who is not given to exaggeration is not only dangerous but usually harmful to the trial lawyer. When this type of a medical witness is encountered, it is no wonder that the most experienced and the most successful trial lawyers in personal injury cases frequently make the statement that the best cross-examination of such a witness is no cross-examination. It is only when the witness is neither truthful, honest, efficient, nor capable—and is given to exaggeration that one can expect to successfully destroy a witness' story by cross-examination."[3]

IT IS one of the scandals of the law (as well as a scandal in medicine) that, in a case involving medical testimony, a litigant can apparently always find some medical expert to support his theory of the case and that the testimony of medical experts varies with the necessities of the side by which they are called. The frequent so-called "legal battles of the experts" probably represent honest differences of opinion which should cast no more reflection upon the psychiatrists than differences of opinion among judges of the United States Supreme Court. Nevertheless, for many years there has been a strong movement, fostered by experienced judges and by the better class of lawyers, to have the experts selected by the judge, either by agreement of the parties or on his own motion. Such experts would owe a duty only to the court—that duty being to determine just where the truth lies as to the rules of the science involved and their application to the facts of that particular case. This movement has resulted in the drafting by the Commission on Uniform State Laws of the Uniform Expert Testimony Act, which it is hoped will eventually be enacted in every jurisdiction.

This act provides that where, in a civil or criminal proceeding, issues arise upon which a court deems that expert evidence is desirable, the court on its own motion, or on request of either party, may appoint one or more experts, not exceeding three on each issue, to testify at the trial. These experts shall make such investigation of the subject matter as they deem necessary and shall make their finding in the form of a written report to the court. In addition to their report the experts may be called to testify by the court or by a party to the cause. The parties themselves may also call experts but must give reasonable notice of the name and address of the expert who is to be called, and the jury shall be advised as to what experts were appointed by the parties and which ones were appointed by the court. An expert may be asked to state his inferences, whether they are based on his personal observation or on evidence introduced at the trial and seen or heard by the witness or on his technical knowledge of the subject, without first stating hypothetically in the question the data on which these inferences are based. The compensation of these experts appointed by the court shall be fixed by the court and thereafter assessed as costs of the suit depending upon which party wins.

The passage of such an act in every state and the adoption of more uniform state laws will effect greatly needed reforms in the law of procedure in respect to those numerous cases where medical expert testimony is needed to guide the administration of justice, particularly in those problems affecting the aging.

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FIFTY YEARS AGO

Geriatrics Now—Presbytiatrics Then

Presbytiatrics is a name proposed for a new specialty in medicine devoted to the study of the diseases and conditions affecting the aged. We now have a special branch known as pediatrics, and there is no reason why, if the diseases of the young are specially studied, the conditions affecting old age should be overlooked. It is claimed that hygiene of old age is relatively of greater importance than that of the early years of life.

From the *Medical Review*, October 1899, via *Southern Medicine and Surgery*, December, 1949.

Paranoid Reactions In the Aging*

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KNOWLEDGE of the behavior and resultant economic and social adjustment of the elderly is as important in medical practice as is the knowledge revealed by a physical examination or a laboratory test. The human organism is exceedingly complex and the defense mechanisms it develops to preserve its integrity at both the physiological and psychological levels are likewise complex. The physiological defense mechanisms, such as an increased white blood count in reaction to an infection, or the sudden release of adrenalin into the blood stream under the influence of fear, are more objective in character and easier to evaluate than the psychological ones.

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The psychological defense mechanisms are subjective and more intangible in their manifestations, displaying themselves in terms of reactions to unsatisfactory personal relationships, frustrations, and feelings of inadequacy. They arise from instinctive drives that cannot be expressed or sublimated in a sociably acceptable manner. These instinctive drives, however complex their interpretation and classification by the psychologist, may be simplified clinically in accordance with Freud into the instinct for self-preservation and the instinct for race preservation.

AFTER a person passes 60, he more or less gradually approaches what is commonly called his "second childhood." He again shows many of the behavior characteristics of his early youth. Stieglitz has questioned whether this may not be truly a reappearance of the suppressed behavior of one's primal childhood. Many of the same characteristics are present, the self-centeredness, selfishness, and limited interest in others. During middle years, although competition is a necessary part of business or professional life, nevertheless children, other dependents, and charities demand our attention and necessitate a varying degree of altruism. Desires for individual gratification are less apparent or usually less possible of fulfillment.

When instinctive drives find adequate outlets, contentment ensues and

*Read at the Sixth Annual Meeting of the American Geriatrics Society, Atlantic City, New Jersey, June 4, 1949.

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relatively little tension arises. But, when these drives are checked, tensions mount, expressed in feelings of anger, irritability, fear, apprehension, suspicion, and self-pity. Psychological defense mechanisms develop to lessen the tension and discomfort.

In the aging, the two most common defense mechanisms are depressive states and paranoid reactions. Such mechanisms, while they seem inconsistent and frequently incomprehensible to others, do afford the persons in whom they develop a certain amount of compensation and often appear to prevent further or more complete personality disintegration. They serve as a means for objectifying aggression. In depressive states the aggression is turned inward on the person depressed, while in paranoid reactions it is directed outward toward others.

The depressive states are emotional in character and are associated with a sense of loss or deprivation. This may be the loss of a relative or friend, of money, position, home, or even change of environment. Such an alteration in a conditioned pattern of response may even be an improvement in the elderly person's economic or social status. Old people may have severe depressive reactions when they suddenly find themselves in an improved but more exacting environment which interferes with their former conditioned adjustment of years' standing and necessitates new adoptive responses. The best therapy in such a situation is to allow them to return to the old environment.

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The paranoid reactions considered in this presentation are variable in degree and may be associated with any type of personality disorder that is pathognomonic to sexagenarians or those more advanced in years. These reactions are not applicable to younger persons. They are to be differentiated from paranoia, a term reserved by Kraepelin for a disease showing an insidious course, unfavorable prospects of recovery, and the permanence of a systematized delusional formation. This is an extremely rare mental aberration and does not come within the scope of this paper. They must also be considered as reaction patterns distinct from the paranoid type of dementia praecox, or that more inclusive grouping of the schizophrenias which show obvious personality disorganization earlier in life.

Paranoid reactions, like depressive states, are not associated with any intellectual impairment unless they occur in a personality disorder in which such impairment is the result of the organic deterioration. Paranoid reactions are more closely associated with the instinctive limitations of individuals suffering from personality disorders. They vary from the mild but well marked crotchetiness exhibited in "cranks" to those who refuse or are unable to recognize their own limitations. The latter project these limitations

onto others with a delusional formation of fear of hostility and persecution on the part of others toward them. They may even react with homocidal intent toward those whom they fear. They believe others are accusing them of limitations or desires, usually of a perverse sexual or asocial nature, which their religious, school, or social training makes them ashamed to accept within themselves. They may go further in their defense formation and believe they are being persecuted because they are illustrious personages and therefore others are envious of them. Thus delusions of power and grandeur may be superimposed upon delusions of persecution.

For purposes of simplification, the paranoid reactions in the aging may be classified into four types depending upon their prognostic significance and the severity of the reaction pattern: (1) a type which may be called "consistent" since it reveals the inevitable but overreactionary annoyances at real physical and environmental limitations, characteristic to some extent of all over 60; (2) a type characterized by episodic paranoid conditions with generally favorable prognosis; (3) the paranoid type of involutional psychosis in which the prognosis is frequently poor; and (4) a type displaying a paranoid trend associated with organic brain disease where the prognosis precludes complete recovery.

This classification can best be substantiated and clarified by case reports illustrating each of the respective types. They are from case records of patients at the New York Hospital-Westchester Division.

Case 1, illustrating the "consistent defense" reaction attendant upon aging.

A married man of 74, from a stable, long-lived family, entered the hospital voluntarily, complaining of indecision and lack of his usual enthusiasm and initiative. His parents who had died at about 80 years of age, while not psychotic, showed evidence of senescence in the terminal years. He had a satisfactory academic career, success as a scientist but with little time or inclination for social contacts. His marriage led to strategic compromises associated with varying tensions of his body. In describing his father's marriage, he said, "the mental strain of marital discord pulled him down so that his efficiency was impaired the same as mine." His only child, a son, suffered from thyroid deficiency, and his embarrassment over the mental and social inadequacy of this child accentuated an innate self-consciousness in social gatherings. A perfectionistic attitude made it difficult for him to accept this son, and he left the care and training of the child to his more adaptable wife. He believed his son's limitations were the result of his own autoerotic practices which had continued after marriage.

Two years before his hospital admission, his retirement had forced him to spend more time with his wife and son which increased his irritability and critical attitude. Inner limitations were attributed to external influences. Fearful of his repudiation, he projected his self-criticism into the minds of others. His attempt to seek interests outside his home increased his somatic tensions. Apprehension of gradually increasing physical handicaps ensued.

Examination on hospital admission showed a man physically well preserved for his years, with blood pressure 165/92, retinal arteries with a slight amount of bending, and arteriosclerotic plaques in the abdominal aorta. The other positive findings were sluggish pupils, diminished hearing, incipient cataracts, and mild prostatic obstruction.

In the hospital there was a prompt relief of his depressive mood, but he was childish, indecisive, restless, full of hypochondriacal complaints, and displayed irritability and a variable persecutory trend. He left the hospital four months later much improved with a diagnosis of psychoneurosis.

He continued to keep in touch with the hospital, and was able to act in an advisory capacity at his office. He returned voluntarily to the hospital two years later at the age of 75 to again escape domestic friction. His neurotic complaints were less, his blood pressure was reduced to 140/80, and his memory was still intact. His mild depressive mood lifted in seven months and he returned home to continue more efficiently than before.

Although at 77 years of age this patient reveals little evidence of organic mental impairment, he continues to have many neurotic symptoms and to be overconcerned about his body. He has an increased self-centering of interest, he repeats his reminiscences, and is easily irritated under the stimulation of new experiences. He still blames his wife and feels he is the victim of an adverse environment. His trend is still of such a suspicious nature as to warrant calling it paranoid, but he keeps it under reasonable control and it may be looked upon as consistent with his advancing years and limitations.

Case 2, illustrating a paranoid condition which manifests itself as a psychotic episode when a sense of security is threatened. The personality was well integrated.

A widow of 64 was admitted to the hospital because her suspicions and delusions of persecution made her adjustment at home impossible.

An only child, she had been dominated by her mother, and her interests restricted to family prestige and social position. She was intelligent and sensitive, but intolerant and snobbish in manner. She finished boarding school, married at 18, and had a well-ordered life until she was 40. At that time, as compensation for the sudden loss of his fortune, her husband started to use alcohol to excess. When he died six years later from a coronary occlusion, the patient marshalled sufficient resources to preserve their social standing. For ten years she lived alone, but had adequate social interests. The menopause was terminated at 53 with emotional composure.

Now she became subject to stresses resulting from the inadequacies of members of her family. Her daughter had marital difficulties and her aging mother, now psychotic with cerebral arteriosclerosis, came to live with her and died two years later in a nursing home. The patient's emotional defenses began to weaken. Within two months she seemed mildly depressed, a condition which two months later was obliterated by delusions of persecution. She accused the maids of stealing from her, the newsboys of soiling her newspapers, and thought the F. B. I. were trailing her.

On admission to the hospital, she was sufficiently conscious of her person to be neatly dressed. She assumed a superior attitude and was argumentative and critical. She was alert to her surroundings with no evidence of confusion or organic mental impairment. Physically she was well preserved. She was hostile, attributed her difficulties to the actions of others, but had sufficient insight to recognize that her release from the hospital depended on her behavior and cooperation. She left the hospital 15 months later, much improved, with a diagnosis of paranoid condition. Thirteen months after discharge she was reported entirely recovered, happy, and leading her usual life.

This woman had always maintained a superior attitude and for many years this was not challenged due to her financial resources and social position. She had been capable of considerable personality integrity and is known to have shown affection for her daughter. But her sense of security was threatened by a succession and summation of events, most important of which was the death of her mother. A depression, which might have been the major reaction in another person, did not play a conspicuous role in her psychosis. Her personality was sufficiently well preserved to enable her to make a satisfactory recovery.

Case 3, illustrating a paranoid reaction occurring for the first time at the involutional period of life.

A married man of 65 entered the hospital with delusions of persecution associated with a depressive mood reaction. The significant persons in his family background were a passive father who died of carcinoma of the rectum at 76, a mother who was domineering and worrisome, and two older brothers who were excitable. All were deceased. The patient had had a public school education, entered business, and at 30 married a woman of 19. Sexual relations were satisfactory until at 46, he became impotent without apparent emotional disturbance. He was emotionally attached to an efficient daughter and he objected when she married.

He had been practical, thrifty, systematic, of good business sense, but unimaginative, impulsive, and with a violent temper displayed in short flare-ups. A leader, aggressive and dynamic, he had been stubborn and unwilling to take advice. With little religious interest, he was of high ethical standards, generous, faithful to his wife, and the only one of his siblings to contribute to the care of his parents. He sought financial security for his old age by putting his money into stocks. While moderately social, he preferred to spend his leisure hours at home with his family and never confided in anyone. Hypochondriasis was prominent in his concern about minor ailments. As he grew older he feared he would have carcinoma of the rectum like his father.

When 64, he lost most of his money through stock market speculations. He became depressed, agitated, retarded, and sought relief in excessive indulgence in liquor for a time. He went to bed, saying he had cancer and threatened to drink iodine. At a private sanitarium, he received subshock insulin injections to which he gave a delusional interpretation. Although treated by Jewish physicians, he believed, being a Jew, that he was in a Nazi camp, and that he was given syphilis by the insulin injections.

He arrived at the New York Hospital-Westchester Division with the diagnosis of involutional psychosis, paranoid type. His blood pressure was 120/70. Hearing was diminished 15 per cent in either ear, contributing to his suspicions. While neat, orderly, and precise, he was tense, noncommittal, negativistic, sarcastic, delusional, suspicious, and antagonistic. He accused the physician of changing the definitions of words, disclosing an erotic, suggestive homosexual trend. "Testicles—test-tickles. Before—peefore. You will soon be calling me Mrs. May or Miss May." He thought the people around him were women dressed as men. He built up a hostile, aggressive defense to what he misinterpreted as hostility in those around him, and on one occasion he had attempted to choke his wife.

Two years after admission, he was transferred to another hospital without any improvement in his condition. When last heard from he was at home with his wife, but was seclusive, suspicious, and argumentative.

Business reverses were apparently the precipitating factor in this patient's illness. His sexual impotence beginning sixteen years previous to admission and the symbolic loss of his daughter through marriage also doubtlessly contributed to his feelings of insecurity. Before he became ill, he had mentioned his fear of dying of cancer of the rectum like his father and he then was approaching the decade of his father's death. In this case the diagnosis was involutional psychosis, paranoid type, as the eccentricity, paranoid trend and evidence of homosexual conflicts were more marked than in a case of involutional melancholia, the usual type of personality disorder at this age period.

THE fourth type of paranoid reaction displays a paranoid trend associated with organic brain disease. Being organic in character, it necessitates a somewhat different interpretation than the preceding three types of functional reactions. Here we are dealing with an irreversible structural process in the brain tissues that precludes complete recovery. The paranoid reactions are a part of the symptomatology of the basic organic brain pathology. In persons under sixty, paranoid symptoms may be present in organic psychoses due to toxic infection reactions, brain trauma, or brain tumor. In the older age group, however, these symptoms are more frequently associated with the organic psychoses comparable to this age period, namely, cerebral arteriosclerosis or senile dementia.

Organic brain pathology appears to favor the formation of paranoid symptoms in two ways: first, as a psychological defense mechanism against the acceptance of the increasing mental incapacity of which the patient senses but is loath to reveal, and second, as a result the organic disease of the brain affecting the inhibitory and discriminative functions of the cerebral cortex. Subsequently, with more extensive brain pathology, there is a loss of sensory acuity and a resultant confusion and misinterpretation of reality. Ordinarily paranoid delusions accompanying brain disease in the aging do not appear well systematized, possibly because of the patient's mental deterioration with

enfeebled capacity of attention and energy to build up an involved and well organized delusional system.

Case 4, illustrating a condition organic in character, but with the same instinctive conflicts of self-interest and desire for propagation as the functional cases.

A married man of 76 entered the hospital in a confused state with delusions of persecution following a mild left hemiplegia which lasted but a few days. A diagnosis of hardening of the arteries, first made when he was 52, was repeatedly confirmed by various physicians. He soon developed peripheral vascular disease with impairment of the circulation of his legs and feet which was slowly progressive in character. At 58, while on a trip to a European spa, he displayed interest in a woman whom he saw only two or three times and immediately lost all sexual interest in his wife. His history suggests he became impotent. He became increasingly suspicious and jealous of his wife whom he mistakingly thought was checking up on him. Forced to retire as a merchant at the age of 66 because of his diffuse vascular condition, he soon lost his money in the stock market through an increasing loss of judgment, and became dependent on his son-in-law. His suspicions were intensified and he became more sensitive, seclusive, opinionated, and argumentative.

During his hospital residence his paranoid trends suggested a defense against certain instinctive frustrations. He became grandiose in his manner and in his trends. Probably in defense of his underlying worries about his inadequacy, he imagined that people were impairing his efficiency by giving him poison. His paranoid defense against the waning of his sexual capacity expressed itself both heterosexually and homosexually in his frequently repeated statements that he was being accused of having sex appeal.

This case illustrates that even organic brain impairment does not eliminate the instinctive patterns, although in more marked organic deterioration the attending anxiety is often alleviated. The organic impairment often releases the control that is exerted over latent homosexual urges when the brain is functioning adequately.

VARIOUS practical problems may arise with regard to the paranoid trends which are associated with organic brain disease in the aging. Frequently the cause is not recognized until after the patient's accusations have received credence and unfortunate situations have occurred. The paranoid delusional symptoms often represent the first evidence of beginning organic brain pathology. The patient may build up a defense against his own feelings of helplessness and frustration recognized by him long before they become apparent to others. He may even take court action on the basis of his delusions of persecution. Sometimes such action is directed toward members of his family who from intimate observations recognize the necessity for treatment and seek his admission to a mental hospital. At other times wills may be changed because of delusional beliefs of the patient which may subsequently, with justification, be contested by the original beneficiary. The

question of the mental competency of such persons often require scrupulous consideration of the facts in addition to psychiatric insight and experience in such situations.

SUMMARY

Paranoid reactions in persons over 60 have been classified into four types: the type consistent with senescence, the paranoid condition type, the paranoid type of involutional melancholia, and the organic brain disease type. Paranoia and paranoid dementia praecox reactions were excluded as not pathognomanic of this group. Four cases, each one illustrative of one of the specific types mentioned, have been presented. It is significant that all of these patients mentioned in the case material were benefited to some degree by hospital treatment and all were again able to function for a time, at least in their homes.

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Fractures of the Vertebrae In the Aged

Edgar M. Bick, M.D., F.A.C.S.* *and Joseph W. Copel,* M.D.*

FRACTURES of the vertebrae in the aged present a number of special circumstances which distinguish them from similar fractures occurring in other periods of life. The therapeutic problems engendered by these circumstances have been solved far more often on the basis of expediency than on that of established observations.

EDGAR M. BICK, M.D.

We have been able to find remarkably little reference to the subject in books or periodicals. Böhler stated rather categorically and without supporting data that treatment of compression fractures of the vertebrae in the aged required strict adherence to the rules of reduction by hyperextension and full time maintenance of the correction by plaster jacket.[1] Turner and Mead have lately discussed the matter in a general survey of fractures of the vertebrae in all age groups. They noted the frequent occurrence of osteoporosis and the advantage of early release from bed rest in their older patients. However, they did recommend hyperextension reduction of the fracture, using a "two-crank bed" 20 to 30 minutes three times a day for this purpose.[2] Albright and Riefenstein in their recent monograph noted that atrophy of disuse may complicate the morbidity in these cases by initiating a "vicious cycle" in the complex osteoporosis-fracture. They wrote, in fact, that "the orthopedic surgeon sometimes unwittingly abets this vicious cycle by overenthusiastic immobilization."[3]

MATERIAL

ABOUT 75 cases of fracture of the dorso-lumbar spine occurring in patients over 60 years of age were collected. About 50 of these were specifically classified as pathological fractures. The rest were not. This would have been a simple enough division if it were not for the fact that even among those not so classified all but a few showed evidence of a greater or lesser degree of degenerative osteoarthrosis, osteoporosis senilis or both. Some of the latter showed wedge-shaped vertebrae secondary to these processes. By the same token not all of the cases classified as pathologic fractures

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were neoplastic. Some of these had been classified as such because of extensive osteoporosis, or secondary osteomalacia. It soon became apparent to us that, with very few exceptions found in the lower age group of this series, all vertebral fractures in the aged may be considered pathologic fractures in the sense of being dissolutions of continuity of bone not possessing the physical characteristics of bone in its normal state.

Since the sole object of our study was the response to treatment of the aged patient suffering from acute traumatic fracture of the vertebrae, 25 cases were chosen from the larger group for study. Two considerations determined their selection: (1) they did not show evidence of neoplasm, Paget's disease, osteitis fiibrosa, or other locally destructive lesions; and (2) their local symptoms referable to the back followed a recent injury.

Statistical tables on a subject so charged with variables as are these cases must be confined to very simple factors. There were 33 fractured vertebrae in a group of 25 patients consisting of 7 males and 18 females. They were:

9 cases between the ages of 60-64
5 cases between the ages of 65-69
5 cases between the ages of 70-74
4 cases between the ages of 75-79
2 cases between the ages of 80-84

JOSEPH W. COPEL, M.D.

These figures merely express the decreasing population of the older decades. They specifically bore no perceptible relation to a comparative degree of osteoporosis.

The distribution of fractures was as follows:

T5—1	T 9—1	T12— 8	L3—2
T6—1	T10—1	L 1—12	L4—1
T7—3	T11—1	L 2— 2	

The preponderance of fractures in the 12th thoracic and 1st lumbar vertebrae is similar to that in other age groups. In no case of this series had the fracture involved the neural arches.

In none of the cases was there any sign of chord compression either immediately following the accident or later in the course of treatment. This does not mean of course that a severe fracture may not involve the chord at the time of accident, but if it does not do so at that time, it appears that regardless of the type of treatment it will not do so later.

TREATMENT

TREATMENT of the earlier cases in this series varied not only in intent but, more often than not, was changed during its course because of actual or impending unfavorable reactions of the patients. In about half of the cases, especially those treated before 1945, reduction by hyperextension was attempted. Usually the attempt was cautious and only in a few instances was

it performed as an immediate maneuver on a fracture table. More frequently a hyperextension frame or bolster was used on the bed with the patient kept supine. In the immediate reduction cases, plaster jackets were applied to maintain correction. In every one of these cases, whether reduction was accomplished by immediate procedure with plaster immobilization or by protracted hyperextension in bed, the method was interrupted long before the end of the time at which it might have been effective. Cyanosis, partial collapse (physiological), and pressure ulceration of the skin, either impending or actual, were the most frequent demonstrable reasons given for interrupting treatment. Subjective complaints such as pain, a feeling of constriction, or, on occasion, emotional objections were other causes of change in the plan of treatment.

The following case will serve as an example:

Case 1. Reduction of a compression fracture at T12 was attempted on a fracture table and a proper hyperextension plaster was applied. The old lady was allowed out of bed in a few days and encouraged to walk. She could not or would not tolerate the plaster, although no objective signs explaining her discomfort were found. A new and more thickly padded hyperextension plaster was put on but this was equally objectionable to the patient. A re-check x-ray film at this time showed the extension of the spine to be only a delusion; it was merely back-bending along the lower lumbar vertebrae. The plaster was removed and treatment continued by a few weeks of bed rest, followed by a spinal brace. The patient recovered without disability except for some recurrent low back pain which caused no obvious difficulty in the performance of her daily affairs.

It may be added at this point that in only one instance in this group of cases was there x-ray evidence of significant correction of the compression, and in spite of apparently adequate maintenance, this correction was lost in the plaster before a second picture was taken.

As the result of repeated similar experiences fewer attempts were made at reduction in the later cases. Braces and even corsets for the more frail female patients took the place of plaster jackets, and periods of recumbency were reduced. These changes in treatment did not at first follow a planned pattern, but seemed to be a gradual recognition of the fact that no obvious harm came from the less aggressive treatment. None of these cases, either among the earlier or later ones, was readmitted for secondary treatment or for complications referable to the fractured vertebrae.

In view of the foregoing observations we have employed a fairly standardized procedure in recent years in the management of uncomplicated traumatic fractures of the dorso-lumbar spine in patients over 60 years of age. The patient is put to bed with a small head pillow. The head of the bed rests on 8- or 12-inch blocks to permit better visibility in the reclining position than is possible when one is "flat on one's back" looking only at the ceiling. A mattress board is used or not as suits the patient's comfort. We

have seen no difference in the outcome of the cases referable to its use. During the first few days, of course, the various systemic reactions of the post-traumatic state are treated as they appear, or better, are avoided if possible by prophylactic measures. One of the most common of these early complications is ileus. This occurs in our experience with even greater frequency in the aged than in other periods. The treatment of this and the other general reactions are those usually employed and their description need not be repeated here.

Whatever type of active or passive exercise is feasible in a given case is started as soon as it can be tolerated. This may be scheduled bed calisthenics or purposeful activity in recumbency directed by the nurse. Movement in bed other than sitting up is encouraged when it can be accomplished without pain. We have seen no necessity for restraining the patient since, during the early period of treatment, he is sufficiently restrained by his own discomfort. The physiological stimulation afforded by such activity and exercise in bed, when conscientiously applied, is at least equivalent if not greater than forced ambulation at this time in a restrictive appliance.

BETWEEN the 10th and 14th day the upper third of the bed, if it is a gatched hospital bed, may be raised not more than 30 degrees. At this time it is easily tolerated and entirely safe. The difficulty is one of nursing care. The patient should not be permitted to slide down in bed to the point at which the angle of inclination lies above the lumbo-sacral junction. If this care cannot be furnished it is better to leave the bed in its original position. During early period of bed care a light-weight brace, or, in the frail patient, a corset will have been fitted. At the end of the second week post-injury the patient is allowed out of bed in the appliance and walking is then encouraged as strength and comfort permit. Usually in an uncomplicated case discomfort at this time is minimal. The patient may be discharged from the hospital or allowed out of home as soon thereafter as he or she wishes.

A TIME schedule such as this of course represents an average. It can and has been varied with the circumstances of the individual case.

> *Case 2.* Mr....., aged 63, a virile, well-set gentleman, walked into the office with a severely comminuted fracture of L3. Except for what he described as "a slight pain" in the mid-lumbar region, he recognized no disability. He refused to go to bed. A spinal brace was made ready in 48 hours. He wore this while continuing his daily affairs as a merchant for about two months, and enjoyed a clinically uneventful recovery. At this writing, 10 months later, he is well, states he is free of pain, and refuses to "waste" the time for another x-ray picture. Whether or not there has been some further compression of the vertebral body, there is no clinical evidence of it, and the stability of his spine is such that he can continue with the work he has always performed.
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> *Case 3.* Mrs....., aged 81, frail, emaciated, quite senile, and rather extensively osteoporotic, had suffered, or at least had complained of

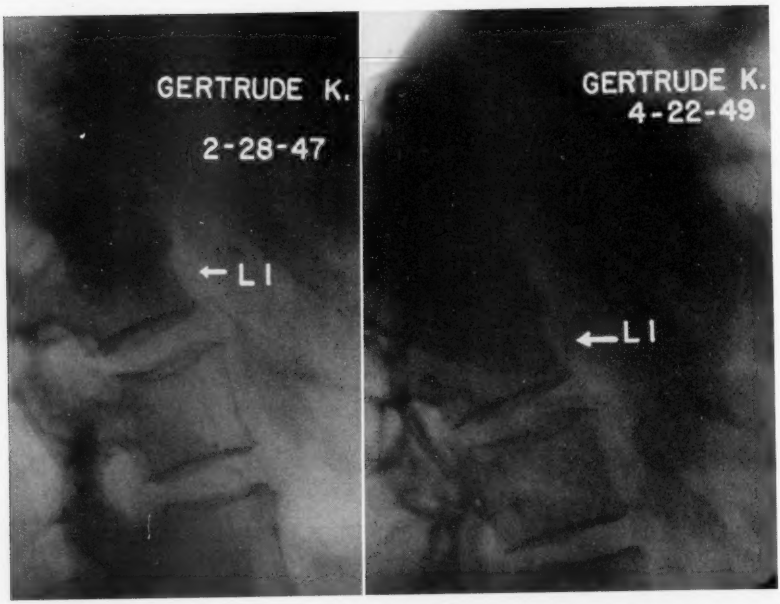

Fig. 1, A and B

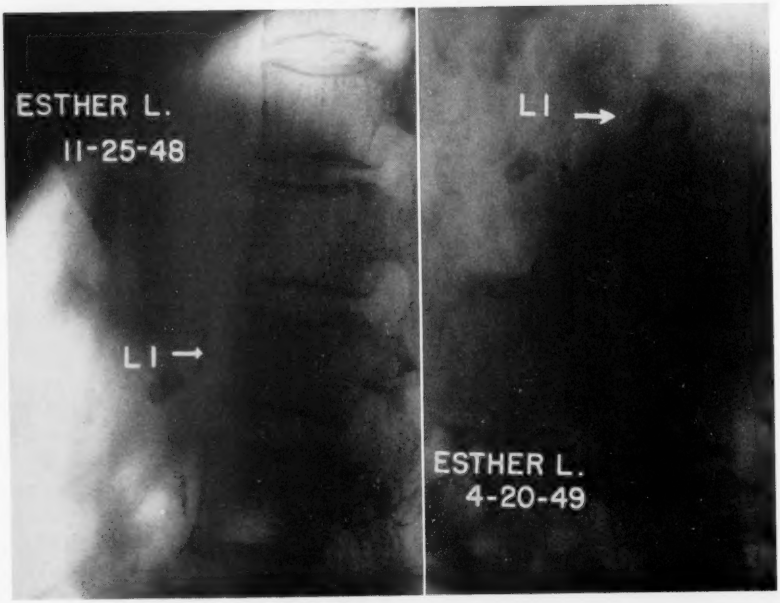

Fig. 2, A and B

numerous aches and pains as long as her family could remember, about 30 or 40 years. She was admitted to the hospital immediately following a severe automobile accident with a compression fracture of T12. Beside the osteoporosis the spine was almost rigid from the effects of osteoarthrotic degeneration. A schedule as outlined above was instituted. During a two-week period in bed, she ignored all instructions that could not be physically enforced by a nurse. She sat up, stood out of bed, and generally moved about as she pleased. At the end of two weeks she was permitted (sic) out of bed wearing a proper corset which she discarded almost immediately. Her family placed her in an old folks' home, and for a year at least, to our knowledge, she complained of all the aches she had before the accident, no recognizable new ones, and meanwhile was getting about with no less facility.

On the other hand, some patients cannot or will not begin walking at two weeks. They may require a few more days, perhaps a week. No attempt is made to force the matter. They are encouraged to keep moving in bed to the limit of their tolerance, and if this is insufficient, active or passive exercises are continued as during the earlier period. Since 1945 no case treated by these principles has required more than 4 weeks before beginning to walk, and all but 2 walked in three weeks or less.

Reference must be made here to the use of androgens and estrogens in the presence of severe osteoporosis senilis. In properly selected cases they are a profitable adjuvant in the relief of symptoms. Their usefulness has been adequately described elsewhere and needs no repetition in this report. They were not required in any of the cases selected for this study, but have been used in a number of instances in the group set aside as pathological fractures.

RESULTS

In cases such as these, end results can be judged only on the simplest possible terms. With few exceptions all of these patients were able to furnish histories of backaches of variable intensity before the accident. By the same token, one cannot say that they were all free of symptoms at the last date of observation. Some degree of persistent backache usually remained with them. (The case depicted in Figure 1 insisted at her last interview—two years and two months post-fracture—that she was not sensible of any symptom whatsoever.) Two points of reference, therefore, must be recognized in interpreting follow-up data in this group: (1) the previously discussed observation that all elderly vertebral columns are to a greater or lesser extent affected by some osteopathologic process in the presence of which any trauma is apt to lead to chronic discomfort, or even pain; and (2) these complaints, variable in intensity and quality as they were, bore no discernible relationship either to the degree of fracture or to the nature of the treatment. With few exceptions none of these cases could be classified as disabled at the time of their last contact. Those who were owed the fact to symptoms referable to arteriosclerosis or its sequelae.

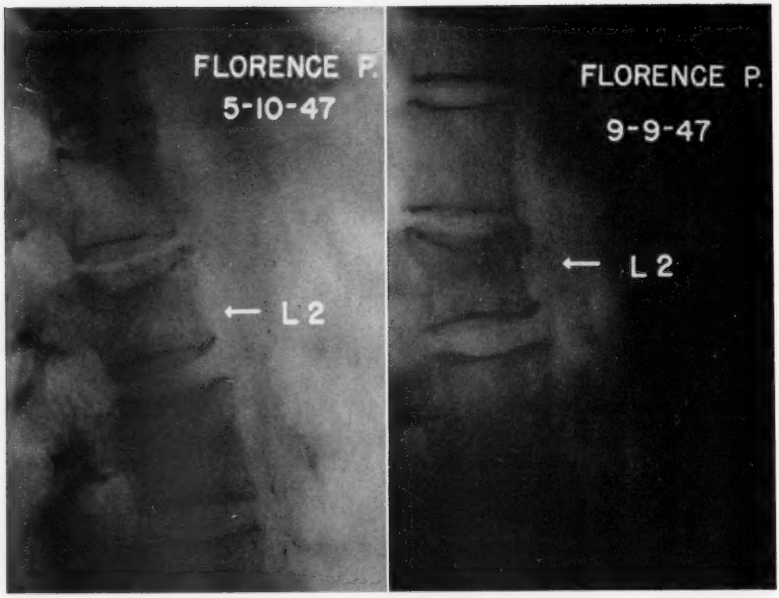

Fig 3, A and B

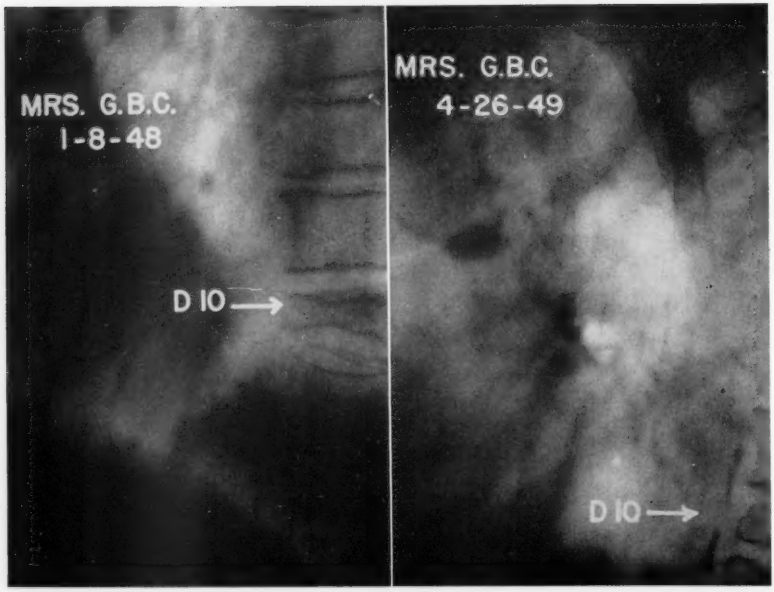

Fig. 4, A and B

In no case in which later x-ray films were obtainable could evidence be found of increased compression at the fracture site. Four typical examples ranging from four months to two and a half years are shown in Figures 1, 2, 3, and 4. This was the one measurable objective finding in our review of these cases, although to us the least important. Far more significant in dealing with the aged is the rapid and apparently, for them, permanent degree of clinical rehabilitation they enjoy with a regimen which does not add to their discomfort and at the same time allows almost immediate body mobility and early ambulation. It is our belief, based on earlier studies by one of us,[4] that the relative rigidity of the intervertebral joints, and the loss of elasticity of the intervertebral ligaments, which accompanies the inexorable process of degenerative osteoarthrosis in these elderly spines, serves as an internal brace sufficient to support the lighter efforts and stresses to which they are subject.

CONCLUSION

1. All fractures of the vertebrae in the aged are to a greater or lesser degree pathological fractures.
2. Compression fractures of the vertebrae in the aged do not require the meticulous reduction and maintenance of reduction customarily advocated, and often demanded, for similar fractures in younger age groups.
3. Two or three weeks of unsupported recumbency in an ordinary bed, followed by sitting and walking in a light brace or corset has proven adequate treatment in these cases. More strenuous treatment is unnecessary and merely adds to the suffering of the patient.
4. In no case of this series have later chord symptoms appeared, nor has other evidence of progressive deformity or dysfunction referable to the fractured vertebrae been found.

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While the fundamental difference between the young and the old organism must be sought in some essential change in the character of the cell, the fundamental difference between childhood and old age can be summed up in this. *Youth wants to know; age wants to be.*—I. L. Nascher, M.D.: *Geriatrics,* Philadelphia: P. Blakiston's Son & Co., 1914.

The Eye and the Aged

Leo L. Mayer, M.S., M.D., F.I.C.S.*

LITTLE HAS been written concerning the aging process of the normal eye, although much research has been done and many articles pertaining to specific portions of the aged eye have appeared. In our present state of knowledge it is not entirely possible to draw a line between physiologic processes of senescence and those of pathologic degeneration.

The study of metabolism of the eye has advanced rapidly since the turn of the century. As with any other organ of the body an approximate idea of the total energy exchange may be obtained by a comparison of the food materials entering and leaving it. Thus, in 1925, Kaneko[1] determined by weight the outflow from the vortex vein as received on a filter paper. In 1933, Duke-Elder[2] summarized the work done on the intraocular fluids, their chemical and physical properties, colloid substances, diffusible substances, abnormal intraocular fluids and their origins. In senescence, hereditary factors and effects of the endocrine glands play a large part in influencing metabolism.

Because development of the eye is characteristic and unlike other organs of the body, it is necessary to consider its embryology and post-natal development. Hirschberg[3] sets the ratio of the sagittal diameter of the eye of the newborn to that of the adult as 3:4. The weight of the two eyes compared with the rest of the body at birth is 1:419, and in an adult the ratio is 1:4,832[4]. While the body increases in volume twenty-one fold from birth to maturity, the eye increases only three and one-quarter times according to Weiss[5] and Vierordt[6].

CERTAIN anomalies of the eye may be present at birth, but, because they do not interfere with its function, they may persist and be recognized only in the adult aging eye. The blood vessels in the primary vitreous are of considerable importance in this respect. Usually these atrophy relatively early and a secondary avascular vitreous is deposited. Frequently, however, the hyaloid artery or the entire sheath of vessels persists and is manifested as a veil leading from the posterior portion of the lens capsule to the vitreous body, either completely or in various lengths.

The other important fetal vestige is the congenital cataract. Usually it is found in the fetal nucleus of the lens which eventually becomes the center of the adult lens. It may show up also as an anterior or posterior polar cataract, more frequently the latter, which is thought to be associated with the persistent hyaloid membrane mentioned previously. Ordinarily congenital

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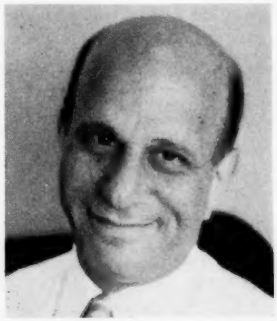
cataracts do not affect vision, and indeed many individuals go through life without any knowledge of their presence. However, at times where metabolism of the lens is unusually poor in the adult, as in diabetes or marked arteriosclerosis, the congenital cataract or lens opacity is enhanced and mature cataracts may result.

Senescent changes in ocular tissue do not occur in advanced age only. On the contrary, they form a continuous process which starts in the cradle and even before. They are determined largely by heredity and embryologic development. To a lesser extent they are the result of the continued stress and strain of life.



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In a consideration of the aging eye it seems logical to proceed from the outer tissues to the inner ones. The lids, lashes, and conjunctiva are the outermost layers. Because of the unusual nature of the skin and subcutaneous tissues of the lids, one notices a narrowing of the palpebral fissures first as a sign of degeneration of the tissues. The skin of the lids loses elasticity, crows-feet appear, and looseness of both upper and lower lids is noted in the normal aged eye. The lashes lose length and abundance. The conjunctiva, which was so clear and moist in youth, becomes streaked with red lines and is dull and yellowish because of loss of water or piling up of epithelial cells.

Corneal changes are similar to those in the conjunctiva since the epithelium is continuous. Thus there is loss of corneal luster. In addition, small fat droplets deposited in Bowman's membrane and the stroma of the cornea produce the arcus senilis, which ultimately becomes a white ring near the limbus encircling the entire cornea. Descemet's membrane shows warts in increasing numbers, the so-called Hassal-Henle excrescences. The slit lamp picks up these degenerative changes readily.

Fatty infiltration and frequent calcium deposits are seen in the sclera.

The uveal layer which consists of iris, ciliary processes, and the choroid shows many changes in the aged. Collagenous tissue becomes enlarged and thickened and undergoes hyaline changes. These changes are rarely distinguished with the ophthalmoscope but may be noted by retinal manifestations of anemia. The root of the iris becomes widened because of tissue sclerosis and the pigment margins around the pupil atrophy. Examination with focal illumination, the slit lamp, and use of a contact lens, whereby the angle may be investigated, are methods used to reveal these changes. Senile warts (verrucae) make their appearance in the elastic membrane of the choroid. They may be seen as yellow spots ophthalmoscopically, and later appear white if calcareous deposits in the form of fine granules are produced in the warts.

Since the retinal layer is so closely connected with the choroid, many changes in the aged eye are revealed by ophthalmoscopy. They may be differentiated as to which layer is affected by the use of red free illumination. Tesselation of the fundus due to atrophy of pigment epithelium of the retina, sometimes called tigroid fundus, is seen frequently. In general arteriosclerosis the retinal vessels, especially the arteries, are narrowed and may show perivascular white lines and become beaded in the periphery.

The optic disk loses its pinkish color and becomes waxy and yellow. In front of the disk the border layer of the vitreous becomes thicker, while the inner part of the vitreous becomes more and more liquid. Both anterior and posterior chambers become smaller due to enlargement of the lens and widening of both iris and ciliary body.

The lacrimal apparatus is affected by age also. With degeneration of the skin tissues, there is a tendency for the punctum to veer away from the conjunctiva of the bulb and thus epiphora or tearing to a degree is noted.

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*Smallpox Vaccinations for the Aged**

Sidney T. Gettleman, M.D.

Age is not a guarantee against smallpox. Vaccination of the aged should be performed as a routine procedure, especially in institutions, believes Sydney T. Gettelman, M.D., of the Racine County Hospitals, Racine, Wis.

Smallpox vaccinations were given to 489 persons ranging in age from under 40 to over 60. The reactions were classified into three groups, the immune, the partially immune, and the full "take." Most of the immune reactions were in the group under 40 years of age. Only about two per cent of those patients over 60 years of age showed full immunity, and about 60 per cent of this group showed the full vaccination "take." These findings indicate that immunity from earlier sources disappears as the individual grows older.

*Smallpox Vaccinations in Institutions for the Aged and Infirm. Wisconsin M. J.: 1079, December, 1949.

Cardiovascular Problems After Age 70*

Ernst P. Boas, M.D.†

CARDIOVASCULAR disease among older persons is due for the most part to arteriosclerosis and to hypertension. I have reviewed consecutive records of 189 of my patients suffering from cardiovascular disease who have died at the age of 70 or over. Of these, 134 (or 70 per cent) had coronary artery disease as the presenting complaint, and 47 (or 25 per cent) had hypertension or one of its manifestations as the chief symptom. Three had auricular fibrillation without other evidence of heart disease, three had calcific aortic stenosis, one had chronic rheumatic valvular disease, dating from youth, and one had cardiac enlargement and failure due to chronic myelophthisic anemia.

In these aged persons the classification of patients into the two categories of coronary artery disease and hypertension is not simple, for both conditions coexist commonly, and it is difficult to determine which of the two is primary or the most significant. Yet it is worth while to attempt such a distinction, for the two conditions basically are totally different disorders; there are many patients with uncomplicated hypertension, and many others with coronary artery disease who never experience an elevation of blood pressure. I have placed into the coronary disease category all patients who at some time in the course of their lives have had manifestations of coronary artery disease. Many of these have hypertension as well. Into the hypertensive category are placed patients whose initial symptoms were caused by diastolic hypertension, even if subsequently some of them developed evidences of coronary artery disease. Thus there is an inevitable overlapping of the two series, and 29 patients appear in both series—these are patients who initially presented themselves with a hypertensive pattern and who subsequently developed symptoms of coronary disease.

This series is too small for detailed statistical analyses, but is enough to indicate certain significant trends that should help to depict the characteristic features of coronary artery disease and hypertension as manifested in these older persons.

CORONARY ARTERIOSCLEROSIS

IN THIS series among patients with coronary artery disease the proportion of of males to females is about 2½ to 1. This contrasts with a ratio of from 5 or 4 to 1 in the middle span of life. An accompanying hypertension is found in

*Read at the sixth annual meeting of the American Geriatrics Society, Atlantic City, N. J., June, 1949.

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40 per cent of the males and in 55 per cent of the females. At younger age groups about half of the men with coronary disease have hypertension, whereas some 80 per cent of women with coronary disease are hypertensive. Diabetes occurred in 8 per cent of the men and in 26 per cent of the women with coronary artery disease. Fully three-quarters of the women with coronary disease had either hypertension or diabetes or both. Among younger women with coronary disease from 80 to 90 per cent have an accompanying hypertension or diabetes.[1]

THUS in these older persons the same trends persist that are observed in younger persons with coronary artery disease. Men are affected more frequently than women, and a very high proportion of women develop their arterial disease on the basis of hypertension or diabetes. But the factors of sex and accompanying disease are not so telling; women are affected more frequently than in the younger age groups, and in both men and women coronary arteriosclerosis develops more frequently in the absence of hypertension or diabetes. From this one may possibly conclude that in the aged coronary artery disease is part of a general arteriosclerotic process, less subject to the influences of sex, hypertension, or diabetes, that seem to accelerate the arteriosclerotic process at younger ages.

Wilens[2] has suggested that localization of intimal atherosclerotic plaques is favored by an increase in the lipid content of the plasma which is constantly passing from the blood into the arterial intima, by an increase in the amount of fluid filtered, as in hypertension, and by interference with the disposal of filtered substances in the fibrous, inelastic arteries of the aged. This last factor must play an increasing role in both sexes in later life, and may account for some of the differences that we have observed.

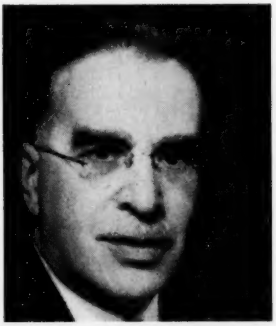
In studying the age distribution of the patients in the present series one should keep in mind the manner in which the cases were selected. They represent persons who died after age 69, and who manifested symptoms of coro-

TABLE I

PATIENTS WITH CORONARY ARTERY DISEASE OR HYPERTENSION WHO DIED AFTER AGE 69

		Coronary artery disease			Hypertension		
		Total	Male	Female	Total	Male	Female
Number of cases		134	96	38	76	31	45
Average age at onset (years)		68.6	68.5	68.7	63.1	66.6	60.4
Average age at death (years)		73.9	73.8	74.3	74.4	74.9	74.1
Average duration (years)		5.6	5.6	5.6	11.4	8.0	13.7
Causes of death in per cent	Coronary thrombosis	34.3	35.4	31.6	25	25.8	22.2
	Cerebral insult	5.2	5.2	5.2	21	16.1	26.6
	Heart failure	13.4	13.7	13.1	13.2	19.3	9.0
	Sudden	17.1	17.7	15.8	13.2	16.1	11.1
	Non-cardiac	15.7	12.5	18.7	15.8	13.0	17.7
	Embolism	0.7	...	...	1.3	...	...
	Stokes-Adams attack	0.7	...	...	...	...	...
	Unknown	12.7	11.4	15.8	10.5	10.0	11.1
Diabetes (per cent)		13.4	8.3	26.3	6.5	6.4	6.6

nary artery disease at some time during their lives. In some the coronary syndrome was a terminal event, in others it could be traced back many years. This contrasts with the usual series in which observation starts with the onset of the illness and is followed for a variable number of years, or until the patient's death. The average age at death for this series, men and women combined, is 73.9 years. Half of the patients died before age 72.5, the oldest at age 87. There was no significant difference between men and women in the age at death. The age at onset was determined from the history and in many cases from observation of the patient in earlier years. The average age of onset of symptoms of coronary disease was 68.6 years, and again there was no significant difference between males and females. The average duration of life from onset of symptoms to death was 5.6 years. Twenty-two lived less than one year after the onset of symptoms. Only 20 of the 134 cases had had symptoms of coronary disease for more than 10 years before death. One, a man who died from a coronary thrombosis at age 80, had had his initial symptoms of coronary disease at the age of 55.



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White[3] from observation of 500 patients with coronary disease for a period of 23 years estimated their average duration of life as about 10 years. Thus most persons who develop coronary disease in their fifth and sixth decades die before they reach age 70. Although, for the most part, persons over age 70 who have coronary disease first manifest symptoms in their seventh decade, they do not represent the late stages of coronary disease developing in middle age. The shorter average duration of life of older persons with evidences of coronary disease should not be attributed to a more malignant character of the disease process as such, but rather to the loss of resistance to disease resulting from the underlying aging process. The increased death rate is in itself a manifestation of aging.[4]

CAUSES of death: About one-third of the patients with coronary artery disease died from coronary thrombosis or myocardial infarction, 17 per cent died quite suddenly, 14 per cent died from heart failure, 5 per cent from a cerebro-vascular insult, and 16 per cent died from causes unrelated to their cardiac lesion. In 11 per cent the cause of death was unknown. There was no significant difference between men and women in the causes of death. These findings contrast with the figures of Levine and Rosenbaum[5] who found that of persons of all ages who had died of coronary artery disease, approximately 40 per cent died of myocardial infarction, 35 per cent died suddenly, 20 per cent died of heart failure and 5 per cent from non-cardiac lesions.

HYPERTENSION

Among the aged, as in the younger age groups, hypertension is more common in women than in men. In this series the ratio is as 3 to 2. The average age at death was 74.4 years and was about the same for men as for women. The age at onset is difficult to establish with accuracy, for as a rule hypertension is discovered only after it has been present for some time. The age at onset indicates only the age at which the patient became aware that his blood pressure was elevated. The average age at onset for the whole series was 63.1 years; but there was a marked difference between men and women. The age at onset of women was on the average 60.4 years; for men, 66.6 years. Accordingly, the average duration of manifest hypertension was longer in females—13.7 years—in contrast to 8 years in men. In the aged, just as at younger ages, hypertension is more benign in women than in men. Eighteen per cent of the women and only 13 per cent of the men died of causes unrelated to the hypertension. A cerebral vascular accident was the cause of death in 27 per cent of the women and in 16 per cent of the men. A cardiac death, on the other hand, was more common among the men. Forty-two per cent of the men and only 33 per cent of the women died of coronary thrombosis or suddenly. Death from heart failure occurred in 19 per cent of the men and in 9 per cent of the women.

Auricular fibrillation unassociated with demonstrable organic heart disease is of little clinical import. It is often called arteriosclerotic auricular fibrillation, but there is no pathological evidence to support this theory of its origin. The irregularity causes little disturbance because the ventricular rate is usually slow, due probably to fibrosis of the auriculo-ventricular bundle and to increased vagus tone. Many of these patients do not require digitalis. The condition does not significantly impair the efficiency of the individual, nor does it shorten life.

Calcific aortic stenosis, according to most recent studies,[6] develops on the basis of an old rheumatic valvular lesion. Among patients in the eighth and ninth decades who have aortic stenosis, a past history of rheumatic fever is rarely obtainable. This is probably due to the fact that a person who survives to an advanced age after an attack of rheumatic valvulitis must have had a mild infection and minimal valvular deformity. Symptoms arise when secondary calcification induces progressive narrowing of the aortic orifice. In many of these patients the presenting symptom is angina pectoris. The coronary insufficiency in many of them is caused not by associated coronary disease but by restriction of the coronary flow in both coronary arteries induced by the stenotic aortic orifice. Some die with the clinical picture of acute coronary insufficiency, others from progressive heart failure. Sudden death is common. Of the three cases in this series one developed heart failure and auricular fibrillation at the age of 67 and died suddenly at age 79, another began with symptoms of angina pectoris at age 63, later developed

heart failure and died of a cerebral vascular insult at age 71, and another developed anginal pain at age 76 and died in an attack of coronary insufficiency at age 81. The diagnosis of aortic stenosis is often overlooked. It should always be suspected in the presence of great cardiac enlargement with a systolic murmur at the aortic area, in the absence of significant hypertension, particularly when there are symptoms of angina pectoris.

Apart from aortic stenosis, rheumatic valvular disease is rarely encountered in the aged. There was only one such case in this series. There are rare cases of mitral stenosis due to nodular calcification of the fibrous auriculo-ventricular ring, which narrows the mitral orifice, but to a less degree than the endocarditic type of valvular disease. The calcified ring may be visualized by appropriate roentgen studies.

One patient in this series had cardiac enlargement and failure consequent on a prolonged myelophthisic anemia. This type of anemia is rare, but the case dramatizes the importance of severe anemia in inducing cardiac damage. In the days before liver therapy for pernicious anemia was introduced this syndrome was commonly seen in advanced cases of pernicious anemia. Today one encounters it in elderly patients who have had prolonged blood loss from hemorrhoids or from gastro-intestinal bleeding. Although anemia as the sole cause of heart failure is uncommon, the fact of its occurrence and an understanding of its mechanism should warn us of the deleterious effects of lesser degrees of anemia on hearts already injured by arteriosclerosis or hypertension. In old persons in particular, the correction of a secondary anemia is an important element in the treatment of the patient with heart disease.

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The Appearance of the Myocardium In Old Age

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SINCE the cause of death in elderly patients is often some form of cardiac failure, it might be expected that changes in the heart muscle should be common. Yet there is little about myocardial degeneration in most of the pathological textbooks. Boyd[1] mentions cloudy swelling as being unimportant, fatty degeneration as following severe anaemia, fatty infiltration as part of general adiposity, and brown atrophy in wasting diseases and old age. Moore[2] mentions focal fibrosis of the myocardium, but says little else about the heart muscle apart from the effects of coronary occlusion. In view of this scarcity of definite information, the post-mortem findings of a number of old persons were studied with special reference to their cardiac muscle.

The material under review in this article comprises 164 subjects between the ages of 80 and 94. All the post-mortem examinations were performed by one of the two co-authors, A. P. Piggot. The present study may be regarded as a preliminary stage for a more detailed investigation which is taking place at the present time. Each case of the present series had a particular note on the state of the myocardium. Some 81 of these also had a description of the state of the coronary arteries in addition.

TABLE I
AGE DISTRIBUTION OF 164 CASES

Age 94	89	88	87	86	85	84	83	82	81	80
Number of Cases 1	2	4	7	10	13	14	28	25	30	30

The left ventricle:

A definite abnormality affecting the left ventricle was present in 119 cases, or 73 per cent. Eight subjects, 5 per cent, showed considerable hypertrophy, while 55, or 33 per cent, had slight to moderate hypertrophy. Some 29 left ventricles, 18 per cent, were dilated, but a combination of

TABLE II
CHANGES IN THE LEFT VENTRICLE

	Per Cent
Considerable hypertrophy	5
Moderate hypertrophy	33
Dilatation	18
Scar of past infarct	12
Generalized fibrosis	10

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dilatation and hypertrophy was very rare, manifested by only one subject, 0.6 per cent. In 20 cases, 12 per cent, there was the scar of a past coronary thrombosis in the wall of this chamber. All recent infarcts were designedly excluded from the series now described. Four subjects, or 2.4 per cent, showed a soft, flabby ventricular wall, while three, 1.8 per cent, were pale and mottled in appearance. In addition, 16 cases, 10 per cent, had generalized fibrosis of the myocardium which was greater in the left ventricle than in the right. Eight cases, or 5 per cent, had a friable myocardium which was more pronouncedly found in the left than the right side of the heart.

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The right ventricle:

Only 14 subjects, or 9 per cent, showed myocardial changes affecting the right ventricle. Two, 1.2 per cent, had cor pulmonale with great hypertrophy and one, 0.6 per cent, showed moderate thickening. Nine, 6 per cent, had a dilated right venticle, three of these having left ventricular dilatation as well. Only one, or 0.6 per cent, showed the scar of an old coronary infarct, and one case had a rupture of the right ventricle, not due to coronary thrombosis. We have seen this latter finding in three cases now and a detailed description of one is in the press.

A. P. PIGGOT, M.C.R.S., L.R.C.P.

General state of the myocardium:

A generalized fibrosis was present in ten cases, 6 per cent, while fibrosis predominantly in the left ventricle occurred in 16 more, or 10 per cent. Eighteen of these subjects had a special note on their coronary arteries. In 13, there was marked atheroma with some calcification. Five others, however, showed only a patchy atheroma in the coronary vessels. A fatty or greasy myocardium, sometimes showing yellowish streaks, was found in nine cases; or 6 per cent. Twenty subjects, 12 per cent, had typical brown atrophy with small, dark-colored, wasted hearts. In these, coronary calcification was three times

TABLE III

VARIETIES OF MYOCARDIAL CHANGE

	Per Cent
General fibrosis	16
Fatty change	5
Friable muscle	17
Brown atrophy	12
Normal muscle	50
	100

as frequent as mere atheroma alone. The commonest change in the heart muscle was to find it friable, easy to break or shred between the fingers. This occurred in 28 cases, or 17 per cent. The whole heart was affected in 20 cases, or 12 per cent; the left ventricle alone or chiefly in eight, or 5 per cent. Some nine, or 6 per cent, of the organs which had this property seemed much softer than normal.

Coronary arteries:

As stated previously in this article, 81 of the subjects had a note on the state of their coronary arteries. Fifty-two, or 61 per cent of these, showed marked atheroma and calcification. Twenty-eight, or 14 per cent, had moderate atheroma without calcification. One subject had *no* atheroma in any branch of his coronary arteries. It seemed from a survey of these findings that all the degenerative changes described above were commoner with coronary changes which were pronounced. Yet they could be found with only moderate atheroma in about one-third of the cases. This suggests that ischemia is not the only factor to be associated with myocardial changes.

SUMMARY

Naked eye changes in the myocardium seem to be much commoner in the left ventricle of old people than in the right. As might be expected from the prevalence of a high blood pressure among this age group, hypertrophy of the left ventricle is not unusual. Hypertrophy of the right ventricle seems confined to cases such as cor pulmonale from emphysema and chronic bronchitis. Terminal dilatation of the left ventricle was found from time to time, as might have been expected. The scars of past coronary occlusion, not infrequent, were 20 times as common in the left ventricle as in the right. One case of idiopathic rupture of the right ventricle was included in the series. As regards the myocardium, the commonest form of degeneration was a soft, friable muscle which could be shredded under the fingers with ease. Less often there were diffuse fibroid changes, commoner in the left ventricle than the right. In a small number of patients there was a fatty change, while typical brown atrophy occurred from time to time.

CONCLUSIONS

Myocardial changes found in 164 subjects over 80 are described.

Fibroid, fatty and friable forms of degeneration of the heart muscle were found in a number of these cases.

Brown atrophy was present in only 12 per cent of those examined.

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Supplementary Treatment of Diabetes Mellitus With Steroid Hormones

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WITH THE DISCOVERY of pituitary and adrenocortical diabetes came the hope that hormones, other than insulin, particularly steroids of the adrenal cortex, testis, and ovary, might be useful in treatment of certain cases of diabetes. At that time, however, these steroids were available only for parenteral administration and nothing was to be gained by substituting steroid hormone injections for part or even all of the insulin required. Now with the availability of more convenient—oral and buccal—dosage forms of steroid hormones, notable advantages to patient and physician might result from reduction or elimination of insulin dosage through substitution of steroid hormones.

Just as excessive pituitary production of gonadotropic hormone in the menopause may be suppressed by administration of estrogens and androgens, in many cases the diabetogenic pituitary principle may be suppressed by these hormones. And when these hormones are administered by routes other than injection, the diabetic welcomes relief from frequent insulin injections.

To date about 300 cases of diabetes similarly treated with estrogens have been reported, with good results in about 70 per cent. Although it was possible to reduce insulin dosage in many cases during steroid hormone therapy, upon withdrawal of steroids insulin doses slowly return to pre-steroid levels. Among the score of authors reporting there was general agreement that no criteria exist by which it is possible to anticipate results of this treatment in an individual case.

A number of similar reports have been made on reduction of insulin dosage by steroid hormones in male diabetics. Estrogens and androgens were used in both males and females.

MATERIALS AND METHODS

Present communication is concerned with treatment of 28 women (Table I) with ethinyl estradiol and 22 men (Table II) with testosterone propionate and methyl testosterone. These 50 patients were selected from over a thousand diabetics under treatment at Charity Hospital of Louisiana, New Orleans, on the following basis: 17 of the 28 women were 40 years of age or over: preclimacteric, climacteric, and postclimacteric. Men were selected from the older age group so as to exclude younger men whose

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This work was aided by a grant from the Schering Corporation, which also supplied the steroid hormones used in the study.

spermatogenesis might be inhibited by massive androgen therapy. Attempt was made to select cases of recent origin. Infection was carefully excluded, but heart disease, if under control, was not a disqualifying factor. Relatively few of the women had menopausal symptoms. All patients were ambulatory. No patient had had previous steroid therapy. Patients were selected on the basis of their reliability, trustworthiness and cooperation as manifested by previous observation.

Each patient was observed for at least three months before steroid therapy. During this time insulin dosage was stabilized and reduced to the minimum required for holding urine sugar-free or not to exceed 1 plus. Fasting blood sugar was maintained below 170 milligrams per cent whenever possible. Household-measured type of diabetic diet to which each patient was accustomed was used. Patients were seen at weekly intervals when home daily records of urinary sugar was reviewed and blood sugar and urinary sugar determined. All female patients were given three 0.05 mg. ethinyl estradiol tablets (Estinyl) daily for the first week and two tablets daily for the second week. Thereafter one tablet was given daily for the remainder of the course, as indicated in Table I. After three months, placebos were substituted for the hormone. After varying periods in 12 cases a second course of steroid therapy was given, 2 tablets daily for a month or longer. In one case a third course was given.

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Male patients were given testosterone propionate (Oreton) 25 mg. intramuscularly each week, plus 4 tablets methyl testosterone (Oreton-M) 10 mg. daily for a month and three tablets daily for three weeks, then two tablets daily to the end of his period of treatment, usually three months. Placebos were then substituted.

Insulin dosage was continued throughout the course of steroid therapy as indicated by the usual blood and urinary sugar determinations. Dosage of steroids was not altered but insulin was gradually reduced in many cases. Placebos were given at the end of the steroid course and were continued until blood and urinary sugar increased, usually 2 to 4 weeks. Insulin was not withheld from patient when it was required. Any patient who did not show improvement at the end of six weeks was removed from the series.

Twenty-six of the 36 courses of androgen therapy gave excellent, fair or good results. Nine of the courses were failures.

RESULTS OF THERAPY

With substantial reduction of insulin dosage as the criterion of improvement, 30 of the 42 courses of estrogen therapy gave excellent, fair or good results. Twelve courses were failures.

TABLE I

DIABETIC WOMEN TREATED WITH ETHINYL ESTRADIOL

Case Number	Age (Years) and Race White. Colored.	Menopause (Years-Months) Surgical	Duration of Diabetes (Years-Months)	Periods of Observation (Days)			Total Hormone Dosage (Mg.)	Insulin (Units)			Results. Excel. Good. Fair. Neg.	REMARKS Mild or Severe toxic symptoms Discontinued treatment Uterine bleeding Protamine Zinc Insulin Regular Mixture Globin Insulin
				Course	Interim	After Therapy		Before Course	After Course	Last Visit		
1	23 C	1-8	1-8	54		62	3.55	15	0	0	G	PZI.
2	28 C		0-6	84		0	5.25	26	0	0	E	M. PZI.*
3	37 C	5-0	5-0	272	34	0	24.45	52	16		E	GI. M.
				111			11.10	15	10	10	F	PZI.
4	37 C		1-0	90	198	67	5.55	30	0		E	M. PZI.*
				123			12.30	20	0	12	E	
5	37 C		6-0	56		41	4.30	20	25	25	N	M. PZI.
6	37 C		2-0	45		163	5.30	25	22	26	N	GI. Allergic to all insulin.
7	38 C		5-0	46		210	3.80	20	20	20	N	Early menopausal symptoms. S.D. PZI.
8	40 C		2-0	89	35	31	5.95	25	25		N	M. PZI.
				37			3.70	40	38	45	N	No menses. PZI.
9	40 C		0-6	97		86	5.90	50	0	0	E	
10	42 C	2-0	0-6	326		105	17.35	34	0	0	E	PZIRM. M.
11	42 C	2-6S	10-0	49		29	3.50	40	40	40	N	PZIR (Separate syringes).
12	45 C		2-0	59		74	4.00	13	0	0	G	PZI.
13	45 C	3-0	2-0	160		70	9.05	25	36	36	N	GI.
14	46 C	6-0S	0-5	88		70	5.45	20	0	0	E	M. PZI.
15	46 C	4-0	10-0	100	49	171	6.05	24	10		G	PZI. S. U.
				39			3.90	40	25	25	F	GI.
16	48 C		3-0	35	80	0	3.50	20	20		N	Hysterectomy U.
				304			30.40	35	10	10	G	S. D. PZI.
17	50 C	9-0	11-0	84		7	4.75	40	36	36	N	PZIRM. S.U.†
18	51 C		7-0	55		15	4.25	40	52	52	N	PZIRM. S. D.
19	51 C	4-0	0-3	35		91	2.80	56	40	60	G	S.D.U. PZI.†
20	53 C	12-0S	12-0	105	38	21	6.30	70	58		F	PZIRM.
				48			4.80	55	45	45	E	S.D. PZI.
21	54 C	10-0S	4-0	125	56	0	7.10	30	0	0	E	S. PZI.
				77	35		7.70	0	13		N	
				182			18.20	13	0	0	G	
22	54 C	6-0	6-0	147	77	0	7.90	80	20		E	No urinary sugar U.
				213			21.30	28	15	15	F	spillage. PZI.
23	55 C	8-0	4-6	81	105	14	5.10	15	0		G	Transfusion.
				58			3.95	20	15	20	N	U. PZI.†
24	56 C	12-0	6-0	63		6	4.20	32	26	34	F	RI. U.D.
25	57 W	12-0	27-0	111	70	38	4.85	54	0		E	U. PZI.
				38			3.80	40	20	36	F	U.
26	57 W	12-0	5-0	70	89	0	4.55	40	12		E	U. PZI.
				46			4.60	14	10	15	G	U.
27	58 C	4-0	7-0	95	43	18	5.80	58	38		E	PZIR (Separate
				35			3.50	32	9	38	E	syringes). U.
28	62 C	15-0	10-0	83	106	111	5.20	64	52		F	S.U. PZI.
				42			4.20	66	50	62	G	

*Menstrual periods increased. †Diagnostic curettage.

TABLE II

DIABETIC MEN TREATED WITH TESTOSTERONE PROPIONATE AND METHYL TESTOSTERONE

Case Number	Age (Years) and Race White. Colored.	Duration of Diabetes (Years-Months)	Periods of Observation (Days)			Total Hormone Dosage (Mg.)		Insulin (Units)			Results. Excel. Good. Fair. Negative.	REMARKS Protamine Zinc Insulin Regular Mixture Globin Insulin Libido increased Potency increased
			Course	Interim	After Therapy	Testost. Prop.	Methyl Testost.	Before Course	After Course	Last Visit		
29	31 C	9-0	252		7	1200	5190	60	55	55	N	PZI.
30	32 C	6-0	116	51	0	250	2250	70	50		G	PZIRM.*
			160			200	6600	64	55	70	F	
31	35 C	6-0	103	34	49	175	2060	50	34		N	PZIRM.
			99			750	3590	55	53	53	N	
32	36 C	4-0	72		0	200	1990	64	50	50	F	PZI.
33	41 C	2-0	168	42	0	600	3790	45	10		G	Constant 3 percent urinary sugar. PZI.
			98				2800	25	15	15	F	
34	43 C	0-7	410		7	1350	5620	20	40	40	N	PZIRM.*
35	44 W	7-0	97		42	300	1330	8	0	0	F	PZI.
36	49 C	13-0	176		0	500	3890	40	40	40	N	P. PZI.
37	50 C	1-0	271		24	900	7670	60	60	64	N	PZIRM.
38	50 W	5-0	91		135	393	1520	25	0	0	E	GI. Prostatic hypertrophy.
39	52 C	1-0	150	34	54	800	3420	25	16		F	PZI.
			112			200	3430	25	0	0	E	
40	54 C	8-0	105	74	0	0	2520	12	0		G	PZI.
			196			1300	2980	15	0	0	G	
41	55 C	6-0	97	41	21	325	706	32	0		G	PZI.
			324			1350	9000	20	10	10	F	
42	55 C	1-0	117	48	0	500	2590	58	18		G	No insulin required for 49 days in middle of second course. PZI.
			337			1750	8580	28	20	20	N	
43	57 W	8-0	97	76	14	750	2360	33	34		N	PZI.
			183			1400	0	25	8	10	G	
44	59 C	4-0	110	21	0	100	4340	20	0		E	PZI.
			36			500	1280	0	0	0	E	
45	62 C	15-0	206		7	925	4360	25	15	15	F	PZIRM.
46	64 C	5-0	104	15	27	425	2180	25	0		G	PZI.
			293			1950	6560	15	10	10	N	
47	68 C	6-0	97	153	20	325	1320	28	0		E	L. P. Digitalis therapy. PZI.
			57	34		0	1220	0	0		E	
			115			1100	2860	25	0	0	E	
48	68 W	15-0	125	99	48	525	2640	40	14		G	L.PZI.
			160			1100	6050	35	25	30	F	
49	70 C	1-0	116		205	0	2560	12	0	0	F	PZI.
50	73 C	5-0	79	54	27	0	2000	20	0		E	PZI.
			145			250	4960	20	0	25	E	

*Separate syringes.

In 30 women (71 per cent) and 26 men (74 per cent) whose insulin dosage reduction was excellent, fair or good, the average reduction was: for women, 27 units (71 per cent); for men, 21 units (62 per cent)—an overall reduction of two-thirds the pre-steroid requirement.

The usual symptoms of high-estrogen dosage—malaise, nausea, vomiting, breast tension—occurred in 14 cases, 7 mild and 7 severe. Estrogen withdrawal bleeding occurred in 9 cases. There was no significant change in blood pressure or body weight.

SUMMARY

Concurrent insulin and oral plus parenteral steroid therapy in 28 female and 22 male diabetics resulted in a two-thirds reduction of insulin requirement. These results suggest the use of this method in men who develop diabetes after 40, and in women who develop diabetes about the time of the menopause.

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*Endocarditis in the Elderly**

Paul Lichtman, M.D., *and Arthur M. Masters*, M.D.

Subacute bacterial endocarditis in geriatric patients may develop following rheumatic or congenital heart disease but can also occur where no clinical indication of valvular disorder exists. Studies of routine old age post-mortem material at Mount Sinai Hospital, New York City, revealed that a third of actual heart disorders went undetected during life. Evidence of cardiac damage was found in 85 per cent of the 406 cases. Valvular damage was present in more than half the patients, the mitral valve being most frequently involved.

Routine penicillin treatment with operative or instrumental diagnostic procedure may obviate development of endocarditis and should be instituted with patients having history of rheumatic fever, loud systolic murmur, or other signs or symptoms of heart disease. Recommended preoperative prophylactic dosage is 300,000 units penicillin intramuscularly while patient is on operating table, 100,000 units one-half hour after operation and three additional injections of 100,000 units at 8-hour intervals thereafter. Following cystoscopy penicillin should normally be continued from 2-4 days.

*Incidence of valvular heart disease in people over fifty and penicillin prophylaxis of bacterial endocarditis. New York State J. Med. 49. 1693-1698, 1949.

GERIATRICS

Official Journal of the
American Geriatrics Society

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Correspondence pertaining to the American Geriatrics Society should be addressed to Dr. Malford W. Thewlis, Secretary, 25 Mechanic Street, Wakefield, Rhode Island.

Family Ties Untied

WITHIN the past two or three years a number of magazine and newspaper articles have been severely critical of facilities and procedures for the care of the mentally ill. One entitled, "Committed!" in the January, 1950 issue of *Woman's Home Companion* tells us that "railroading" of elderly patients is a common practice in some states and particularly points to New York as an offender. The article indicates something must be wrong with the statutes or practices regarding both the commitment and the discharge of senile patients. Contrariwise, in this issue of *Geriatrics*, a paper by Doctor Harold Lovell cites the New York statutes and interprets them as proper and equitable.

It is generally agreed that statutes country-wide pertaining to the mentally ill, and also the mentally deficient, should be less strict. The patient should be dealt with somewhat more on a medical basis than a legal one. In that connection, statutory terminology should be tempered similarly. For example, the terms mentally ill, mentally deficient, patient, hospital, and provisional discharge should replace insane, feeble-minded, inmate, asylum, and parole. The term senile person might well be used instead of mentally ill to mean any person who is of unsound mind and in need of treatment, control, or care due to advanced years.

Terminology is of only secondary importance, since meanings and connotations tend to change with time. It is the current application of the statutes which is of greater concern. Unfortunately, however, almost everything which was thought good yesterday seems to be railed at by many today. There is ample readiness to point an accusing finger at someone else. One may wonder how many of the hypercritical are motivated how much by guilt feelings.

A recent change in commitment laws in some states is publicized as advanced thinking. It provides a patient may be admitted to and detained at a state hospital upon certification of (1) a health officer or (2) a physician. This

is a new field for the health officer and vests him with powers and duties beyond his recognized specialty of preventive medicine. "Committed!" makes quite a point of supposed "railroading" via the certificate of a single physician. The article infers that a physician might be persuaded to certify a sane patient into a state hospital. Conceivably an honest error in judgment might occur. Therefore, certification should not be the responsibility of one person. Moreover, the procedure is generally considered as contrary to the constitutional provision "no person shall be deprived of his liberty without due process of law." The preponderance of professional opinion is that one's entrance into a mental hospital and continued residence therein should be a voluntary act or by order of a court of competent jurisdiction.

The protection of the patient's liberty does not or should not cease with his adjudication by the court as a mentally ill or senile person. If the state hospital superintendent finds that a committed patient is not psychotic the statutes should provide that he must certify it to the proper hospital authority. Upon receipt of the superintendent's report and recommendation for discharge as not psychotic, it should be the duty and power of the authority to discharge the patient forthwith. In fact, such is the law in many states.

It is true that professional personnel and facilities are inadequate to care for the increasing number of mentally ill patients admitted to state hospitals. There are about one-half the number of physicians and nursing personnel prescribed by accepted minimum standards. The reasons for the lack of physicians are (1) inadequate compensation, (2) no postgraduate training opportunities, (3) no research advantages, (4) inadequate housing, (5) geographical isolation, (6) unfavorable publicity.

Country-wide over the past 25 years, there has been a considerable increase in the number and ratio per population of resident patients in state hospitals. The variations from state to state represent primarily differences in the extent of the facilities available for the care of the mentally ill and reflect secondarily the rate of turnover in the hospitals. The general rise in patient population has been ascribed to (1) increased capacity of hospitals, (2) a growing awareness of the need for early treatment, (3) an increase in population, (4) a lengthening average life span and shifting age distribution of the population, resulting in greater exposure to the risk of hospitalization in those age groups in which the incidence of mental illness is likely to be highest, and (5) increased urbanization with greater demands on the individual and less ready care in the home for the aged and infirm.

With advanced years comes a greater likelihood of disability incident to old age, particularly mental disability. The number of patients first admitted to state hospitals at age 65 years and over has increased from about 15 per cent in 1935 to 35 per cent today. State hospital construction must allow for housing of the aged.

The degree of mental disability due to cerebral arteriosclerosis, hemorrhage and thrombosis, cardiorenal disease, and cerebral changes due to senility per se, such that an elderly individual thus affected may require state hospitalization depends somewhat upon one's philosophy. Extramural care of the elderly mentally ill can often be provided, if not by the patient's own family, then in a boarding or family care home. If the patient is also physically incapacitated, it is more difficult to obtain care outside the state hospital.

Family responsibility for its ailing members seems to be on a steady decline. The government appears to be ready to take care of us. Retire us at age 65 years on a federal pension to disintegration or isolation in a system of subsidized state homes! Family integrity is out of date! Hell bent at high speed here comes and there goes our civilization!

ROYAL C. GRAY, M.D.
Chief, Mental Health Unit, Minnesota Division of Public Institutions

PROGRAM OF THE

AMERICAN GERIATRICS SOCIETY

Seventh Annual Meeting

JUNE 1, 2, 3, 1950

HOTEL COMMODORE NEW YORK CITY

This meeting is dedicated to the memory of a distinguished leader in the field of geriatrics.

DR. I. LEO NASCHER

Dr. I. Leo Nascher, known as the father of geriatrics, will be honored this year at the seventh annual meeting of the American Geriatrics Society as the man responsible for introducing our modern concept of medical care of the aged. A true pioneer in this heretofore uncharted area of medicine, he was the first person to use the term "geriatrics," the first doctor to prepare an American textbook on the diseases of old age, one of the first to lecture and write on the subject. He was a founder of the New York Geriatrics Society which is no longer in existence and the first honorary president of the present national group.

Ignatz Leo Nascher was born on October 11, 1863, in Vienna, was educated in the public schools of New York City, and received his medical degree from the New York University School of Medicine in 1885. He was chief of clinics at Mt. Sinai Hospital for many years. In 1916 he accepted a position in the Public Welfare Department of New York, a post which he held until his retirement in about 1929. Dr. Nascher wrote many papers for medical journals during his professional career, including fifty articles on geriatric subjects. He is credited with coining the term "geriatrics" in a paper published in the *Medical Record* in 1909. His monumental work was his book, **Geriatrics. The Diseases of Old Age and Their Treatment,** published in 1914. Dr. Nascher died in 1944 after a lifetime devoted to geriatrics.

Special Invitation

Dr. Hollis E. Clow, President of the American Geriatrics Society, and Director of Laboratories and Internist at the New York Hospital, Westchester Division, announces that the Board of Governors and the staff of the New York Hospital invite members of the society and their wives to visit the hospital in White Plains, Thursday afternoon, June 1, 1950, from 2:00 to 5:00 P.M. There will be a tour of the hospital followed by tea. Cars will meet the members at the White Plains railroad station and return them there in time to reach New York City for the annual business meeting.

Notice to Non-Members

Please register before attending meetings. There is no charge. This program is your invitation.

THURSDAY, JUNE 1, 1950

8:00 P. M.—Business meeting. Fellows invited.

FRIDAY, JUNE 2, 1950

8:30 A. M.—Registration

9:00 A. M.—Scientific Session

Diagnosis of Cancer in the Aged by Sponge Biopsy.
Bernard L. Cinberg, M.D., Adjunct Professor of Obstetrics, New York Polyclinic Post Graduate School, New York City.

The Role of Lecithin in the Development and Treatment of Atherosclerosis.
O. J. Pollak, Ph.D., M.D., Chief, Departments of Anatomical, Clinical and Experimental Pathology, Quincy City Hospital, Quincy, Massachusetts.

Steroid Hormones in Geriatric Practice.
Joseph L. DeCourcy, M.D., DeCourcy Clinic, Cincinnati, Ohio.

Better Bread as a Source of Protein and Calcium for the Aged.
Clive M. McCay, M.D., Professor of Nutrition, Cornell University Laboratory of Animal Nutrition, Ithaca, New York.

INTERMISSION

Subject to be announced.
Grace Meads, Ph.D., Institute for Cancer Research, Lankenau Hospital, Philadelphia.

The Genesis of Prostatic Enlargement.
Stanford W. Mulholland, M.D., Professor of Urology, Woman's Medical College, Philadelphia.

Alterations in Renal Hemodynamics in Aged Males Following Administration of a Pyrogen.
Nathan W. Shock, Ph.D., Chief of Gerontology Section, National Institute of Health, Bethesda, Maryland

The Role of the Adrenals in Certain Degenerative Diseases.
Willard O. Thompson, M.D., Clinical Professor of Medicine, University of Illinois College of Medicine.

FRIDAY, JUNE 2, AFTERNOON

2:00 P. M.—Scientific Session

Senescence in Relation to Chronic Arthritis.
Russell L. Cecil, M.D., Professor of Clinical Medicine, Cornell University Medical College, New York City.

Hypoadrenocorticism in Alcoholism.
Harold W. Lovell, M.D., Associate in Neurology, Flower and Fifth Avenue Hospitals, New York City.

Gout: Early Clinical Diagnosis and Management.
F. Daniel Suttenfield, M.D., Washington, D.C.

Geriatrics and Rehabilitation.
Howard A. Rusk, M.D., Professor of Rehabilitation and Physical Medicine, New York University Medical School.

INTERMISSION

Significance of Dietary Cholesterol in Coronary Arteriosclerosis.
Alfred Steiner, M.D., Associate in Medicine, Columbia University College of Physicians and Surgeons.

Syphilitic Heart Disease in the Aged.
Frederic D. Zeman, M.D., Mount Sinai Hospital, New York City.

Vascular Disease in the Aged.
Ned Shnayerson, M.D., Adjunct Professor of Surgery, New York Polyclinic Post Graduate School, New York City.

An Evaluation of Alcohol in the Symptomatic Management of Angina Pectoris.
Henry Russek, M.D., Consultant Cardiologist to Seaview Hospital and Instructor in Medicine, New York Medical College.

AMERICAN GERIATRICS SOCIETY ANNUAL DINNER

FRIDAY, JUNE 3, 1950

7:00 P. M.—Cocktails

7:30 P. M.—Dinner

Harold W. Lovell, M.D., Toastmaster.

Address: Willard O. Thompson, M.D., Clinical Professor of Medicine, University of Illinois College of Medicine.

Guest of Honor: John Erdmann, M.D., New York City.

SATURDAY, JUNE 3, 1950

9:00 A. M.—Clinical Session to be held at The Home For The Aged
121 W. 105th Street, New York City.

Gastric Photography.
Malford W. Thewlis, M.D., Thewlis Clinic, Wakefield, R.I.

The Natural History of Coronary Artery Disease in the Elderly.
Ernst P. Boas, M.D., Assistant Clinical Professor of Medicine, Columbia University College of Physicians and Surgeons.

Rejuvenative or Eliminative and Preventive Treatment of Senility.
Vladimir Korenchevsky, M.D., Professor of Experimental Physiology, Oxford University, England.

INTERMISSION

Manifestations of Psychoneurotic Conditions Occurring in Later Life.
Hollis E. Clow, M.D., Director of Laboratories and Internist, New York Hospital, Westchester Division, White Plains, N. Y.

Rheumatic Valvular Disease in the Aged.
Howard B. Sprague, M.D., Chief of the Medical Staff, House of the Good Samaritan.

The Limitations of Aspiration Biopsy of the Bone Marrow and the Diagnosis of Multiple Myeloma.
Lawrence H. Beizer, M.D., Instructor in Medicine, Graduate School of Medicine, University of Pennsylvania.

The Utility of Nerve Blocking in the Management of Peripheral Vascular Obstruction.
Emory A. Rovenstine, M.D., Professor and Chairman, Department of Anesthesiology, New York University College of Medicine.

LUNCHEON as guests of The Home for the Aged, Courtesy of Dr. Frederic D. Zeman.

SATURDAY, JUNE 3, AFTERNOON

The Integration of Medical and Social Agencies in Community Planning for the Aged.

2:00 P. M.—Dr. Zeman, Presiding

The General Hospital.
Martin Steinberg, M.D., Executive Director, The Mount Sinai Hospital, New York City.

The Hospital for Chronic Disease.
Martin Cherkasky, M.D., Director, Home Care Program, Montefiore Hospital, New York City.

The Home for the Aged.
Robert S. Beekman, M.D., Attending Physician, Peabody Home, New York City.

The Family Welfare Agency.
Mrs. Amy Powell, Director, Fields Memorial of the Family Society, Boston, Massachusetts.

The Recreation Center.
Mrs. Helen Laue, Director of Recreation, Chicago Community Project for the Aged.

The Church.
Paul B. Maves, D.D., Drew Theological Seminary, New Brunswick, N. J.

Grow Old Gracefully

THE "rest and take it easy" advice so often heard in the past has been undergoing a definite change. This is true not only in the hospitalization periods recommended for surgical, obstetrical and coronary cases, but there is a growing tendency to stress the advantages of keeping the aged active.

Dr. Herman Seidel, chief of medicine at the Hebrew Home for the Aged and Infirm in Baltimore, Maryland, recommends work and exercise and avoidance of sedentary habits for the old.

In a new book, *Rehabilitation of the Handicapped*, edited by William Soden, Dr. Seidel records his Ten Commandments for Growing Old Gracefully:

1. "Continue to work at your vocation and retain your accustomed position in society as long as possible.
2. "Avoid sedentary habits and inactivity. Continue with whatever open air activities or hobbies you may be accustomed to; if you have none, you should acquire some.
3. "Engage in systematic daily exercises, designed to prevent or overcome physical deformities; these should include deep breathing.
4. "Make full use of helpful gadgets, such as hearing aids, eye glasses and dentures.
5. "Keep face and body free from unsightly blemishes.
6. "Always maintain self-respect and dignity, be jealous of your appearance, dress neatly and retain good manners.
7. "Continue contact with buddies and lifetime friends and learn to make new ones.
8. "Follow good body hygiene and sanitation; eat sensibly a well-balanced diet of nourishing food.
9. "Seek medical advice at frequent intervals and carry out in full the advice given.
10. "Above all avoid despair and an outlook of futility. Fear God and keep His Commandments for this is all that is required of man."

A. E. HEDBACK, M.D.
Editor

*Socio*medical Progress

Devoted to constructive correlation of interrelationships between sociological and medical problems in the aged. . . .

The Use of Leisure Time in the Adjustment of Older People

Helen Noyes

THE ADJUSTMENT of older people is a difficult problem dependent upon inter-relationships of economic, social, physical and psychological factors. The leadership of the medical profession is needed in interpreting to communities that food, shelter and protective care will not provide physical well-being if the older person is allowed to live a life of mental and physical inactivity. Since employment opportunities for older people have been severely limited by technological improvements, reducing the labor force needed, it has become increasingly important to consider how to enrich the leisure hours of those who have no steady occupation.

This is particularly true for those who have not been able to reserve funds to cover the needs of retirement, for there is an additional trauma for a mature person in the acceptance of dependency. We have all observed how unrealistically many older people fight to maintain their assumption that they can take care of themselves with funds that are manifestly inadequate. Acceptance of dependence may mean to them a lowering of prestige, a loss of initiative, and disintegration of personality. If our modern life robs the older person of his financial independence, we must find other ways to bring dignity and purpose into his life.

Some older people are able to solve these problems themselves. Let us cite the experience of an older woman who had entered a home for the aged after two catastrophes in her life—the loss of money in the depression, and the sudden death of her husband. She wanted very much to make the lives of under-privileged children happier by making clothing for them which they would take pleasure in wearing. However, she was blocked by the item of expense, for she could not buy materials for these garments from her slender allowance. About the same time another resident went to the house director with a very similar request. She was in the habit of attending her church sewing group, and had learned that they were planning to sew for needy children at home and abroad. The club supplied the materials and took responsibility for distributing the garments. It was agreed that the two women would combine their projects and organize a sewing group at the home. Making children's dresses became an absorbing interest to this group of women. One, who had never sewed much before, found she could do beautiful work in spite of limited vision. They divided up the work using those with special skills for the more intricate sewing or detail. The dresses caused so much comment that in addition to the work for needy

children these women were soon filling orders for dresses to be sold at the home bazaar and as private orders on which the maker was able to have a profit.

We cannot think about this project without visualizing the pleasure with which these women showed their handiwork and talked about the children who were to receive the garments. These were not the discouraged older people we sometimes see. These women were meeting a need as fundamental as the need to eat and sleep when they formed this group to sew together, for they found a skill which gave them prestige, an opportunity to use their imagination in creating useful and beautiful garments, friends whose mutual pleasure in the project enhanced their own satisfaction, and a purpose in living, something worthwhile to do. The heavy burden of dependency was lessened by the opportunity to make a gift to the community and the home that sheltered them. In addition they enjoyed the unexpected opportunity to earn a little money that was theirs to use in any way they wished.

This group of women found that the leisure time of the home for the aged offered them an opportunity to develop new interests. They had the initiative to get their project going with very little outside help. Sometimes this is not so easy to accomplish, for the trauma caused by change in the way of life may be so great that the individual withdraws from activity. This was true of another woman who entered a home at the time her eyesight became too poor for the exacting detail of her former work. She had developed great skill in making exquisitely colored slides for the stereopticon. Her unhappiness over losing her cherished occupation was due partly to the loss of the prestige which the excellence of her workmanship had created for her, and partly to the genuine humiliation over finding herself unable to work longer for her own support. The superintendent in the home where she lived recognized what had happened to this woman, and determined to help her find a new absorbing interest. It was during the war, when clothing for refugee families abroad was in great demand. The woman learned to make charming hats for the children of the different nationality groups, using her discriminating color sense in a new art form where she could employ ingenuity and imagination. In this new accomplishment, she forgot her bitterness over the loss of her employment, for she was less dependent now that she was a contributor as well as a recipient, and she had discovered a new skill which gave her pleasure and a sense of achievement. Yet without the stimulus from the superintendent, who knew that her failure to make a good adjustment in the group masked a deep discouragement over loss of the prestige and pleasure of the successful artisan, she might not have discovered this new and satisfying occupation. There are many older people who cannot accept constructively changes which come in the aging process without this kind of assistance.

Not every person has to have a complete change of activity in the later years. When it is possible to continue into the new leisure of retirement an old and familiar occupation which has brought pleasure and distinction, the adjustment is just that much easier.

These people who have just been described lived in homes for the aged where they were guaranteed protective care for life. Their energies were not exhausted in an effort to provide basic physical necessities for themselves. Relieved of the struggle for self-maintenance, it became increasingly necessary for them to find purposeful living in some other way. They had initiative enough to find their own activities either alone or with a little initial help. Where more intensive study is needed before the individual can be understood, it is more often possible to help if there is someone, perhaps a doctor, a social worker, sometimes a friend, who can take time to work with the individual to help him to see how he can make the changes necessary to achieve happiness through a different

way of life. It is often not possible to accomplish this, unless the person who is helping him can understand the personality structure of the individual as it is revealed in frequent interviews. It is important to extend this kind of help because so many older people set themselves apart from friends and associates through the blundering confusions resulting from their discovery of the loss of capabilities and skills as they grow older. Physicians and psychiatrists treat many of these people. Some of them need a more fundamental approach than the social case worker is equipped to give. For many an older person, however, the opportunity to discuss his changing situation with an understanding person, who has knowledge of the meaning of the experience he is undergoing, leads to more imaginative and intelligent effort to find new achievements, new friends, new satisfactions.

In our effort to help the older person, we will need to remember that he will seek to meet certain basic needs. He will want to be assured of shelter, food and whatever additional care his physical condition necessitates, for as long as he lives, and without the trauma of uncertain change to an unknown new situation. He will want to continue to enjoy the companionship and mutual affection of friends. And he will want to be able to make the most of whatever capabilities he has in satisfying achievements, even though this may require continuous change as his activities become more limited. When he makes this intelligent use of his abilities, so that he is an active alert person, he will find that he is compensated for his loss in physical powers, by his capacity for seasoned judgment, by his deeper understanding arising from his long experience, and that he will win recognition for these qualities. If he allows himself to be cut off from social contacts with friends and to live a life of listless idleness, he may become so embittered that he will lose the sense of balance we associate with wisdom and old age.

When an individual becomes a troubled person, it may be difficult for him to work back into a normal life of activity without individual help. There is an additional approach, that of the recreational group, which is needed in certain cases. It is a more indirect attack which helps the individual to concentrate not on unwholesome brooding over personal needs, but on broader and more out-going interests. For the less troubled, it may prove a preventive measure or an opportunity for an enriched and more satisfying life experience. No one can under-estimate their importance who has watched the older people in recreational groups lose diffidence and unsocial attitudes, and become warmer people, more understanding of the foibles of their neighbors, more tolerant of differing points of view, through the friendly social atmosphere of these clubs.

The need for group associations is one reason why so many older people fail to enjoy association with each other. They have lived alone so much that they have fallen into the habit of thinking only of themselves. They need the experience of sharing with others pleasures which the recreation groups give. It is important for them to share new ideas as well as pleasures. They will be happier people when their interests are less isolated. When they acquire the habit of accepting changing ideas, they will be better able to understand the society in which they live. When we remember that 14.4% of our population will be 65 and older by 1980, we are impressed with the necessity to offer this large percentage of our population every educational advantage which they can enjoy. Recreational groups serve a double purpose. They meet the basic needs of the individual, and they help him develop a broader perspective on his responsibilities of citizenship.

In the recreational centers, the recently retired older person may find a new way of life without going through the unhappy period of inactivity and loneliness we have observed so often. The person who has felt "left behind" may win back a new sense of "belonging." Personalities change when those

older people find from personal experience that the day for creative activity has not passed, that it is not too late to learn new skills, to form new friendships.

It is in new ideas which are absorbed so naturally in the group life that the recreational groups make their greatest contribution. Club members learn to respect the differing religious philosophies as they share the religious holidays of others in the group. They learn to honor and acclaim their common heritage in American citizenship. In the simple "give and take" of club life, they learn, with the help of the group leader, to think of others in the group, and to make decisions about club life based on the greater harmony of the many rather than the few. At first, most older people are diffident and shy, afraid to speak opinions boldly, or to assume responsibility. Gradually distrust is overcome by the growing confidence in the group leader, whose acceptance of each member of the group disarms their fears. As the mutual trust develops, frank and free discussion becomes possible and the setting for true democratic participation is created. As individuals are discovered who can take leadership responsibilities, they are given that opportunity. The value of using many people in leadership roles becomes the accepted standard of the group. Rivalries create tensions, but these tensions lessen as the members of the group learn to value group participation and success rather than individual competition.

The success of recreational groups proves that older people want more normal relationships, more companionship, and more to do. It is our responsibility to bring them back into active participation in the life around them. Homes for the aged provide a natural setting for experimentation in this direction, and are already demonstrating how the sense of personal freedom is increased when the residents are given some way to participate in planning and policy making. Communities can well afford to develop community centers where cultural activities, adult educational projects, recreational programs are available, and where the individual is given a practical demonstration of democracy in their freedom for individual participation in club life.

Medical science has ensured us a longer life expectancy. To make this long life profitable and interesting we must dignify the retirement years by offering changing interests for changing needs. Continuous stimulus for intellectual participation will keep the older person abreast of the trends in this modern age. We must help him to grow in tolerance and understanding of the inter-relationships of the life around him. If his physical activities must decrease because old age has brought decreasing physical strength, we must help him to recognize that he has earned the right to enjoy a less strenuous way of life and that we still need to have him share with us his mellowed judgment, his wisdom born of experience and contemplation.

Helen Noyes has been Director of the Division for Care of the Aged of the Federation of Protestant Welfare Agencies in New York for a number of years, and is well equipped to write on social problems among older people.

Trained in medical social work, Miss Noyes has recently become Director of Social Service at Louisville General Hospital, Kentucky. Her position carries the responsibility of lecturer in social problems in the University of Louisville School of Medicine.

New York Plan for Elderly

A "New York Plan" for the elderly has been proposed recently, with stress upon local community approach, emphasis on a variety of modes of attack on problems of the elderly, and a preventive approach aimed at forestalling the difficulties of the elderly rather than concentrating on easing their plight after they need old age assistance, old age homes and hospitalization.

The plan calls for integrating services for the aged with the general community services for all citizens whenever possible, instead of separating older people from the rest of the community. It also provides for linking private and public agencies, and makes recommendations for both state and community developments.

Specific recommendations at the state level include: creation of a division of adult hygiene and geriatrics in the State Health Department; state aid for recreation centers for the elderly; establishment of a special counselling and placement service in the State Employment Service to help older persons obtain jobs; provision of funds to establish state-wide adult education programs for older persons; creation in the State Labor Department of a permanent agency to promote employment of the aging in business and industry; establishment of a law to prevent discrimination against older persons seeking licenses or permits; and setting aside in all state-aided housing projects a proportional percentage of apartments for older people.

Community approaches to problems of the aging are also recommended, as follows: a permanent community job finding service for older persons; a financial counseling service; facilities for the chronically ill, and clinical and diagnostic services for the elderly; improved standards for nursing and old age homes; community programs to inform the public as to needs of the elderly in old age assistance, based on a decent and adequate standard of living; new concepts of local health department activities to develop health education programs directed toward the aging; a community mental hygiene program designed for the middle aged and older; a community recreation program for the elderly to promote purposeful and creative activities; an adult education program, embracing hobby and crafts activities and retirement adjustment courses; a community agency comprised of private and public groups to coordinate all local programs for the elderly, to develop resources for them, and to educate the community to their needs.

The New York Plan has been developed by the New York State Joint Legislative Committee on Problems of the Aging, of which Senator Thomas C. Desmond is chairman.

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Michigan Institute on Aging

The third annual Institute on Living in the Later Years sponsored by the Institute for Human Adjustment of the University of Michigan will be held in Ann Arbor, Michigan, June 28, 29 and 30.

The three-day program will embrace the mental health and medical problems of an aging population, together with proposed programs in education toward aging. In addition to a program of speakers prominent in their respective fields, the Institute will include organized discussion groups on various pertinent topics and demonstrations of work carried on with older people.

Further information may be secured from the University of Michigan Extension Service, 4524 Administration Building, Ann Arbor, Michigan.

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Older Persons Hobby Show

The fourth annual Hobby Show for Older Persons, sponsored by the Welfare Council of New York City, coordinating and planning council for the social agencies in New York, will be held from May 4th through May 14th at the American Museum of Natural History.

Personal Adjustment in Old Age. Ruth Shonle Cavan, Ernest W. Burgess, Robert J. Havighurst, and Herbert Goldhamer. 1949. Chicago: Science Research Associates. 204 pages, $2.95.

This is a report of studies of the personal adjustment of a selected group of elderly people made by sociologists from Rockford College and the University of Chicago. It is a most welcome addition to the limited amount of available literature on problems of aging. The selective group of elderly people under study here are not representative of the general population, as the authors are constantly at pains to remind the reader. They are higher in age, in economic and employment status, and in levels of education. All of them are white and more of them are native born persons residing in urban centers with a background of professional experience than is generally true. The group also includes a greater proportion of persons who are still, or have in the past been, directly associated with religious organizations. The group does approximate the population as a whole in its social relationships.

The conclusions or findings of this study are not to be regarded as universally applicable. However they are summarized clearly and succinctly and do help measurably in understanding the individual older person. They add little that is new or significant to the body of actual knowledge about older people nor to that about attitudes toward them which has been gleaned previously through observation. They do provide important substantiation of a sizable part of that knowledge through systematic and meticulous evaluation of all source material, objective and subjective alike. They also point the way to areas of research which now can be defined somewhat more carefully.

In the matter of health, which is the aspect of greatest interest to clinicians, the study leaves much to be desired. The group under study maintained a better health level than is usually found in the age group represented. The soundness of these findings is subject to some question, since they are based upon the personal opinions or statements of the old people themselves and upon judgments reached by the use of necessarily arbitrary but very carefully established measures or guides. Lack of a physician's or psychiatrist's professional diagnosis or prognosis in defining the relation of the individual's health to his personal adjustment to old age not only raises questions as to the validity of some of the findings, but more especially it indicates how essential to genuine understanding of the adjustment of the individual is the partnership of members of several disciplines—the physician, psychiatrist, psychologist, social worker and social scientist.

Personal adjustment of older persons and those factors which effect its satisfactory achievement by individuals are as yet virtually unexplored territory by any one of the scientific groups. This study makes a distinct and valuable contribution toward the development of methods and tools for further scientific work in that area. Due weight is given to the individual's age culture pattern as one of the forces which affects his personal response to old age and the changes which it brings. Measurement of adjustment becomes the determination of the degree of integration or of imbalance between the satisfaction of personal needs and society's demands. It is pointed out that there are two possible approaches to this measurement—that of determining the "aggregate of the person's adjustment in the different sectors of his experience" such as family and employment, a multiple rather than a single conception of adjustment; or as the "over-all happiness or satisfaction of the person with his present situation." For most older people, the latter approach seems to be more appropriate at the present time. For this reason the following five criteria of over-all adjustment were adopted: (1) Participation in activities; (2) satisfaction with activities; (3) happiness; (4) absence of non-adjustive behavior; (5) degree of fulfillment.

Without claiming competence for sound critical comment on the methods of building the inventory of attitudes and the inventory of participation in activities, this reviewer believes the results accomplished by the use of these inventories, checked and counterchecked as they were by interviews and reports of trained observers, would seem to support their general validity. It is to be hoped that through their use in future similar studies they will be gradually modified and more fully adapted to the purpose for which they were developed.

Any physician or social worker examining the inventory of activities will immediately sense the omission of one activity which is an inescapable part of the daily life of every human being, that of securing, preparing, and eating food. This activity, which is apt to be not only more time and thought consuming for older people, but also to present more actual physical and even psychological difficulty, needs evaluation because of the double role it plays in the maintenance of

health of an older person. The therapeutic value of a "cup of tea," or even the nutritional value of dinner, may depend on whether these must be always taken alone or occasionally enjoyed in company with friends.

This book is recommended for serious reading and consideration by all persons interested in or engaged in work with older people. It will support them in many of their convictions derived from experience. Beyond that, it will provoke differences of opinion which will lead to further studies of this kind which are so much needed. Most important of all, it gives encouragement to development of research methodology which promises more comprehensive and more intensive study of personal adjustment to old age. The authors are to be congratulated for so effectively indicating new ways by which it may be possible to discover the road to better understanding of what makes for, or prevents, satisfactory adjustment to old age. Such understanding is the key to the creation of a socially healthy community in which older people can live as personally undefeated members of it.

OLLIE A. RANDALL
Consultant on Services for the Aged
Community Service Society of New York

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Electrocardiography. Fundamentals and Clinical Application. Louis Wolff, M.D., 1950. Philadelphia: W. B. Saunders Co. 187 pages, $4.50.

This book represents a different approach to the subject of electrocardiography. The author's stated aim "to teach the reader the fundamental aspects of electrocardiography and their application to clinical interpretation" has been adhered to admirably.

The reader is first given an explanation of the electrical phenomenon arising in the heart. From the fundamental concepts of the electrical phenomenon associated with muscle contraction, through the electrical phenomenon which are responsible for the various waves in the electrocardiogram, the reader is made aware of the fact that the recorded electrocardiogram is a result not of a particular disease but of a change in electrical pattern due to changes in muscle fibers.

From the purely theoretical discussion of electrophysics the author enters into a discussion of standard, unipolar, and precordial leads which is understandable to the average beginning student.

The second portion of the book is devoted to practical application of the principles outlined in the chapters on fundamentals. While the author's discussion of bundle branch block might be subject to controversy, nevertheless his viewpoint is well presented. The remaining standard electrocardiographic patterns are adequately discussed. The reviewer was particularly impressed with the chapters on pulmonary embolism and especially the Wolff-Parkinson-White syndrome. This book is to be recommended for those who wish to learn electrocardiography from the fundamentals rather than by set patterns.

ARTHUR C. KERKHOF, M.D.
Division of Internal Medicine
University of Minnesota Medical School

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Outwitting Your Years. Clarence W. Lieb, M.D. 1949. New York: Prentice-Hall, Inc. 278 pages, $2.75.

Outwitting Your Years is delightfully easy reading, intended for the older person himself. The book is a guide or personal reference to be read and consulted frequently. It takes up elementary problems of aging, many of which go unanswered because they seem so commonplace and simple that older people hesitate to bring them up.

A great deal of emphasis is placed upon the mental attitudes of older people and the importance of keeping mentally alert and happy. One of the important points is that people must prepare for old age much as they do for maturity or for their life work. This preparation must be carried out physically, mentally and spiritually.

A good chapter on bridging the gap between generations provides many useful hints on how that process can be achieved. Interestingly enough, this chapter is followed by one entitled, "Who Wants to Be Young?" as if to provide the older generation with answers to give to the younger members of their families. In this chapter, too, helpful suggestions are given to the relatives on enriching the lives of older people.

This book contains a frank discussion of retirement, attempting to explain at what point it should enter into the process of growing old gracefully. People need preparation for retirement just as they do for active life. Dr. Lieb believes that chronological age should not be the criterion for retirement, but that retirement should be selective and based on unfitness for work. He strongly recommends hobbies for everyone and presents a consideration of them for people at various economic levels. He includes a unique and original chapter on politics as a hobby for old people.

A section of the book is devoted to illnesses common to old people and suggestions for better health programs.

Doctor Lieb's book is well worth recommending to older people especially and to all who are interested in this common problem.

ANNE LAURIE BAKER
Director, Social Service Department
University of Minnesota Hospital

DIGESTS *from Current Literature*

Surgical Management of the Aged.

PETER CHILDS, F.R.C.S., and S. A. MASON, D.A., *Brit. M. J.* 1391, December 17, 1949.

With the average age of the population steadily increasing, larger numbers of elderly people are in need of surgery each year. If proper provisions are taken, age alone is not a contraindication to major surgery.

The following precautions for surgery on the aged are advised by Peter Childs, F.R.C.S., and S. A. Mason, D.A., based on the results of major surgery on 99 patients over 70 years of age.

Care should be directed especially to the cardiovascular and respiratory systems, as the commonest cause of death in elderly surgical patients is cardiac failure, and major chest complications are common when there is a pre-existing respiratory disease in association with an abdominal operation.

Preoperative measures which should be taken when possible include improvement of general nutrition, correction of dehydration by intravenous saline, blood transfusion, breathing exercises and relief of distention. Premedication should avoid scopolamine and minimize morphine.

The position of the patient on the operating table must be carefully supervised, as older people are prone to osteoarthritis, and the skin withstands pressure badly.

The most important postoperative measures are early ambulation and deep breathing. Even patients undergoing suction should sit up within 12 hours after operation. Prophylactic antibiotics are routine in major surgery.

Older patients usually require a longer period of convalescence, which has created a serious problem because of the shortage of hospital beds. A home nursing service is suggested to meet this need.

Chronic Sick and Elderly in Hospital.

PETER MCEWAN, F.R.C.S.E., *The Lancet* 1098, December 10, 1949.

Because a rapid physical and mental decline often takes place when the elderly patient comes to the hospital, a geriatric service is needed which will enable the aged to remain at home.

Peter McEwan, F.R.C.S.E., and S. G. Laverty, M.R.C.P., feel that an outpatient (chiefly physiotherapeutic) department will enable many elderly people to maintain a good enough state of health and mobility to avoid hospitalization, and that a home nursing service should also be available.

For those aged patients who must be hospitalized, cheerful surroundings, adequate recreation and occupational therapy should be provided.

Peritonitis in the Aged.

THOMAS C. CASE, M.D., *Am. J. of Surg.* 78:801-803, 1949.

Deaths from peritonitis among elderly patients can be held to a relatively low figure. The disease differs, in these patients, only in degree from that in others. The feeble circulation, tissue atrophy, and decrease in the formation of antibodies which accompany old age, and often a poor mental attitude, lower the general resistance to disease.

No specific treatment can be prescribed for acute peritonitis, but a successful recovery usually depends on early diagnosis, prompt surgical intervention, and thorough preoperative and postoperative care.

While surgery does present certain difficulties in old people, Thomas C. Case, M.D., does not believe that such treatment should be avoided simply because of the patient's chronological age. A good nutritional balance should be maintained preoperatively, and the state of the tissue functions and the cardiac state should be considered carefully. The anesthetic used should be one which will produce a minimum of visceral damage, and surgery should be as limited as possible but as extensive as necessary.

Intestinal obstruction is one of the most important factors in peritonitis fatalities. The Miller-Abbott tube is of great help in attempting to overcome this factor. For the best effect, the tube should be passed before the operation.

The sulfa drugs and antibiotics now in use should be of considerable help in lowering the peritonitis death rate among old people. Penicillin, streptomycin, sulfadiazine, and the sulfanilamides are usually used in combination. Peritonitis caused by pneumococcus or streptococcus can generally be controlled with chemotherapy alone.

The diagnosis of postoperative peritonitis is quite difficult, and for this reason secondary operation is seldom undertaken on these patients. Chemotherapy, decompression, and other supportive measures are the prescribed treatment.

The Cardiology of Old Age.

C. J. GAVEY, M.D., *The Lancet* 257:725-735, 1949.

Treatment is more vital than diagnosis in the senile patient with heart disease. In a study of patients aged 70 and over, C. J. Gavey, M.D., of London found that hypertension and coronary disease were the dominant etiological types.

Two-thirds of the patients examined were hypertensives, considering a pressure exceeding 160/100 as abnormal. However, especially in the senile, treatment need not neces-

sarily be instituted if the pressure exceeds this figure. Hypertensives, among the most robust aged, frequently go on living without producing pathological symptoms with a pressure over 160/100.

No useful correlation was found between the various degrees of arteriosclerosis in different parts of the body, nor was there a useful correlation between the blood pressure and arteriosclerosis in the various clinically accessible arteries. The incidence of anterior and posterior coronary infarction was equal.

Patients with congestive heart-failure benefit from treatment with digitalis and mercurial diuretics. Digitalis is especially useful in preventing paroxysmal dyspnea. Quinidine is used in fibrillation caused by a transient agent such as anesthesia. Barbiturates foster mental confusion in the aged. Aminophylline by mouth, though not suitable for continued use, is a relief from injections. Patients in a chronic state of failure with edema may be relieved with Southey's tubes or multiple incisions.

Electrocardiographic and radiological studies not uncommonly revealed normal appearances by standards accepted for young adults, suggesting that these standards remain correct for old age.

In emergencies the operative risk of a patient with a faulty heart must be taken. However, an operation of choice or convenience may precipitate a myocardial infarction or death.

Increase in Peptic Ulcer of the Aged.

F. W. Mulsow, M.D., *Am. J. Digest. Dis.* 16:383-385, 1949.

Exhausting physical and nervous types of work, recreation, and vacations are contributing factors in the increase of peptic ulcer in people beyond the age of 60. According to F. W. Mulsow, M.D., Cedar Rapids, Iowa, such strains tend to disturb the eating habits and circulation of older people. Increased use of alcoholic and carbonated beverages influences the higher incidence, as does the use of more sugar, tobacco, and coffee by women. Missing teeth and poorly fitting dentures among aged patients hinder ability to masticate meat properly, resulting in a diet lacking in sufficient protein content, which may be a factor in the healing rate of peptic ulcers. The fact that more people are reaching the older years also accounts for some of the increase.

More accurate diagnoses and the fact that older patients are hospitalized more frequently because of serious complications accounts for the growth in reported incidence of peptic ulcer. Many cases formerly reported as cancer are now found to be ulcers. Hospitalization is often required for a proper diagnosis, as differentiation between gastric ulcer and gastric cancer frequently requires surgery and microscopic examination.

Tuberculosis in the Aged.

Jay L. Sitterly, M.D.,* *J. Kansas M. Soc.*, 50:547, 1949.

Tuberculosis is an increasing cause of death in the aged. Several factors account for this increase. From a numerical and statistical standpoint there are more aged; also diagnosis and therapy is better in the lower age groups. In addition the physiological responses of the senile to tuberculosis are less apparent and disabling, thus permitting patients to forego medical care.

Many clinical diseases in the aged are an endogenous exacerbation of a previously quiescent or arrested tuberculosis, believes Dr. J. L. Sitterly. Contagious cases should be hospitalized to protect the family and public. However, facilities for the care of chronic, contagious cases are practically nonexistent. As the life span lengthens and the total number of clinical tuberculosis cases increase, the need of public protection will increase.

Psychiatric Problems in Nebraska's Older People.

G. Lee Sandritter, M.D., *Nebr. S. M. Jour.*, 34:384-386, 1949.

Emotional distress in elder people is an increasing concern of the specialist, the general practitioner, and society in general. Before 1919, senile and arteriosclerotic first admissions averaged 17 per cent of the total first admissions to Norfolk State Hospital, Norfolk, Nebraska, with only 2 per cent ever able to leave the hospital. Now 46 per cent of the first admissions are senile and arteriosclerotic patients with approximately 4 per cent able to leave the hospital permanently or for short periods.

Old people should be hospitalized and treated as early as possible, believes G. Lee Sandritter, M.D., of the Norfolk State Hospital. Electric shock therapy is valuable in treating severe effective reactions if used in the early stages of agitation or depression.

Though the outlook for old people leaving a mental hospital and taking their places in the community is increasingly hopeful, many remain who must be cared for. One solution, the special semi-hospital type of institution provided on the West Coast and in heavily congested Eastern districts, is impracticable in states where a supply of active, progressive staff physicians is unavailable. When staffed by laymen, homes for old people may degenerate into what used to be known as the poor farm. An alternative is special semi-hospital quarters for old people built in connection with state or general hospitals. Patients would then be close to adequate mental and medical attention when necessary. Removal back to the semi-hospital quarters could take place when a patient had sufficiently recovered from an acute episode.

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Geriatrics *in the* NEWS

Meetings and programs

The annual meeting and twenty-third scientific session of the American Heart Association will be held at the Fairmont Hotel, San Francisco, June 22-25, 1950. All those desiring to attend should make room reservations at the earliest possible date.

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The British Medical Association will hold its 118th annual meeting at Liverpool, July 18-21, 1950. The Joint Secretary, L. Z. Cosin, F.R.C.S., Langthorne Hospital, Leytonstone, London, E.11. England, would like to hear from American physicians interested in geriatrics, who would wish to contribute to the meeting by means of an article or in the discussion.

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Problems of the 45- to 65-year-old worker will be discussed Wednesday morning, April 26, 1950, at the annual meeting of the American Association of Industrial Nurses, Inc., at the Hotel Sherman, Chicago, Illinois, April 23-29, 1950.

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A training course for employment and placement counselors working with handicapped workers will be held in New York, May 22 to June 16. Information may be obtained from the National Personnel Registry and Employment Service of the National Society for Crippled Children and Adults, 11 South LaSalle Street, Chicago 3.

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The faculties of the medical schools of Boston University, Harvard and Tufts, all of Boston, have joined forces to present a 26-week series of educational radio programs on preventive medicine, entitled "A Long Life." Programs are broadcast each Tuesday at 10 p. m. over stations WCOP and WCOP-FM.

A continuation course in care for the aged in institutional homes was presented by the University of Minnesota at the campus continuation center on March 13, 14 and 15.

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Geriatric research

One major research project in the field of chronic disease undertaken at Goldwater Memorial Hospital has as its objective the discovery of new knowledge of lipid metabolism.

Researchers are: 1) documenting the development of arteriosclerosis in a group of individuals over a period of a decade and are relating the degree of arteriosclerosis to a variety of physiological and pathological data; 2) endeavoring to produce a similar disease in animals.

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A chemical pharmacology section has been established as a part of the intramural research program of the National Heart Institute, National Institutes of Health.

Doctor Sidney Udenfriend, who heads the units within the section, will investigate the metabolic transformation in the body of drugs and other substances of biological significance to the cardiovascular system, the kidney, and the aging process.

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Ground was broken recently on property of the Massachusetts General Hospital, Boston, for a new $2,750,000 research building dedicated to the investigation of the diseases of old age. It will have six stories and a penthouse.

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Effects of America's declining birth rate and lengthening life span will be made the subject of a five-year study by the University of California's Institute of Industrial Relations, supported by a Rockefeller Foundation pledge of $125,000.

Problems to be investigated include effects on the national standard of living of the withdrawal of workers from the labor force at fixed retirement ages, the fiscal consequences of pensions for a growing proportion of the population, and the many social implications of an aging population.

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Fremont, Michigan

Geriatrics in the News (Continued)

With the geriatricians

Dr. Edward J. Steiglitz discussed preparation for retirement at the annual training course on Industrial Relations Counsellors at Williamsburg, Virginia, November 15, 1949. He presented two papers before the Conference of Internists of the Southeastern Area of the Veterans Administration held at Memphis, Tennessee, November 19 and 20.

On December 12 and 13 he made teaching ward rounds and gave five lectures on geriatrics at the Tuscaloosa (Alabama) Veterans Hospital. He served as consultant during a Conference on Research in Gerontology at Teachers College, Columbia University, December 16 and 17.

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A program of long range geriatric care, was outlined by a group of specialists at the meeting of the New York Joint Legislative Committee on Problems of the Aging early in December, 1949.

Speakers included Dr. C. Ward Crampton, chairman, subcommittee on geriatrics, Medical Society of New York County; Commissioner Marcus D. Kogel of the Department of Hospitals; Dr. E. M. Bluestone, director, Montefiore Hospital for Chronic Diseases; Dr. Robert T. Monroe, Peter Bent Brigham Hospital, Boston; and Dr. James M. Dunn, Rehabilitation Division, Veterans Administration.

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Dr. Theodore G. Klumpp, who is author of several articles dealing with old age problems, was sworn in by Mayor William O'Dwyer of New York as a member of the Mayor's Advisory Committee for the Aged.

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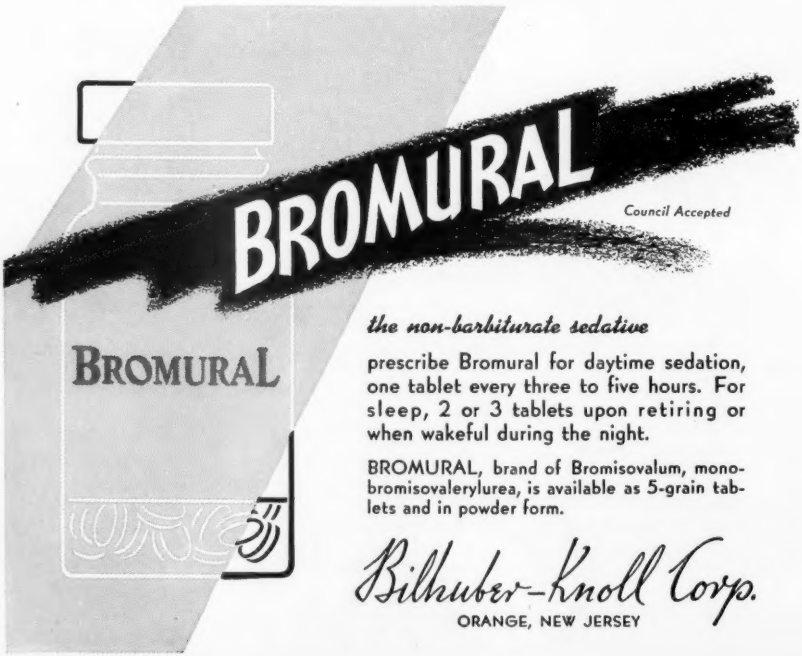
Health and medical care

A detailed study of Wisconsin's needs for the chronically ill and aged has been conducted by the medical society of that state. The resulting publicity has created considerable public support for legislation offered in the current session by the society seeking permissive laws for the building of county infirmaries for the aged and chronically ill, and state aid for their maintenance.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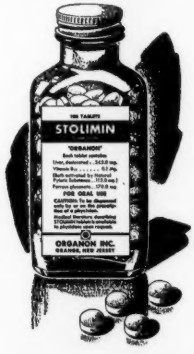

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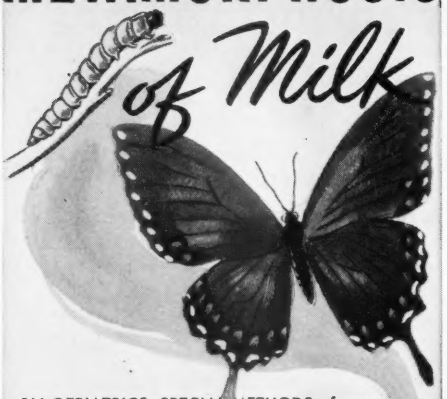

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1. Brown, S. A.: In Problems of Aging and Old Age, 1928-1929, p. 1090.

2. Sebrell, W. H.: In Geriatric Medicine, Edit. by R. J. Stieglitz, 1943, pp. 209-10.

"JUNKET" is the trademark of Chr. Hansen's Laboratory, Inc. for its rennet and other food products, and is registered in the United States and Canada.

Geriatrics in the News (Continued)

Modern drugs and surgical techniques are making it possible to perform major surgery on the aged, it was said at the dedication of Pacific Home's new $200,000 hospital at Los Angeles on January 30, 1950.

Built on the grounds of the Pacific home, the new building is furnished with the latest equipment including physiotherapy apparatus, and contains 50 beds.

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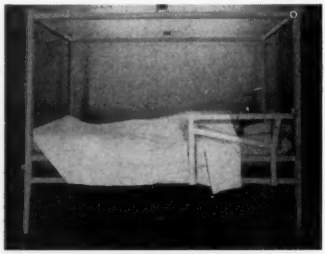

The geriatric utility bed used as a general hospital or home bed.

A design for a geriatric utility bed for senile incontinents is described in the Psychiatric Quarterly Supplement, Volume 23, pages 131-134, Part 1, 1949, by Frank J. Pirone, M.D. of West Brentwood, New York.

The chief advantages of the bed, according to the article, are "the elimination of trauma to, and movement of, an aged patient; specific aid in feeding the patient; easy care of the necessary and vital functions of the patient in a natural sitting position, and the provision of an incentive for occupational therapy."

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A woman as she grows older has different amino acid content from that of a man, according to a report given by a group headed by Dr. Philip G. Ackerman of Washington University School of Medicine, St. Louis, to the American Chemical Society.

The concentrations of eight of the more essential amino acids were measured in the blood plasma of young and old individuals. In the case of six out of the eight chemicals, the change was different in the two sexes.

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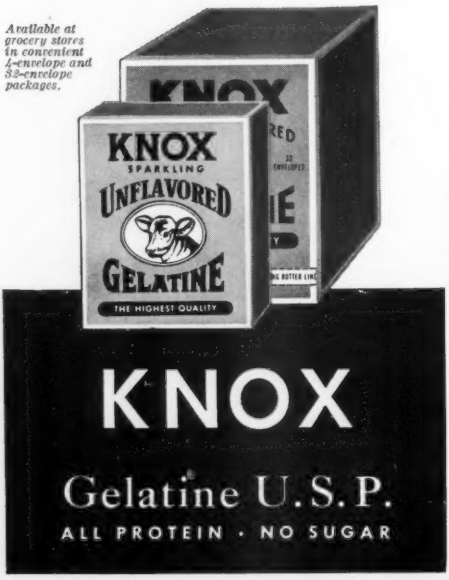

Geriatrics in the News (Continued)

There is a society in England whose avowed purpose is living to be 100 years old. This goal, the members claim, may be achieved by following three simple rules: (1) Eat only garlic, lentils, fresh meat and large quantities of fruit. (2) Be cheerful, read the comics and don't worry. (3) Surround your home with a pleasant garden. The present average age of the rules-making committee, however, is just 37 years.

•

Statistically speaking

The average length of life in the United States has increased to 67.2 years, according to the National Office of Vital Statistics of the Public Health Service. The 1948 average length of life, the highest figure on record, was 0.4 years above the 1947 average of 66.8 years.

•

The census bureau reports that 3,500,000 Americans over 85 years old have no cash income at all. This group makes up nearly one-third of the 11,000,000 persons in that age group, not counting inmates of institutions. The remaining 7,500,000 had a median cash income of $808.

AN APPEAL

We who are working on the editorial content of GERIATRICS find ourselves besieged with inquiries for the names of geriatricians, the names of geriatric clinics, the names of educational institutions conducting institutes or courses in geriatrics. Many of these inquiries come from the lay public but a surprisingly great number come, also, from physicians.

It is our aim to provide you with a magazine which you will come to look on as indispensable as a source of information and as complete in its field. (There are those who say that we are accomplishing just that.) Our general aim being thus known, will not you who call yourself a geriatrician please be good enough to have your secretary send us a note giving the requisite information and those who are associated in geriatric clinics send us a letterhead. We repeat, we are at your service and we want to be informative when queried; without the facts and the identities of individuals and their affiliations we work in the dark.

GERIATRICS

Musculoskeletal Inadequacy and Failure in the Aged*

Otto Steinbrocker, M.D., *Sheldon Schwartz,* M.D., *Samuel Sverdlik,* M.D., *and B. M. Bernstein,* M.D.

DISEASE of the musculoarticular structures is one of the most common causes of disability in the older age groups. Owing to the expanding life expectancy and the greater number of people now surviving to the later decades, the number of patients with degenerative musculoskeletal disease apparently is increasing. For the same reasons, and also as a result of more widespread awareness of their differentiation, such arthropathies as rheumatoid arthritis and the joint involvement of acute rheumatic fever now are diagnosed more frequently in the aged. The importance of the locomotor diseases in the practice of geriatrics, therefore, is growing steadily. The various rheumatic and related conditions affecting muscles and joints[1] are found at all ages and in the elderly, too. Naturally, osteoarthritis and soft tissue lesions or disturbances as concomitants of degenerative aging processes are the most common.

THERE occurs in the elderly a combination of symptoms and signs arising in the musculoskeletal system, consisting chiefly of pain, progressive generalized muscular weakness, debility, limitation of locomotion and of articular range of motion resulting sometimes in deformity. This clinical picture is most frequently the result of, or intimately associated with, degenerative changes in joints. These features, however, may characterize many conditions involving the musculoarticular structures, whether mechanical, pathologic, or psychogenic. They may arise from a primary disorder in joints and supportive tissues, or they may be due to some local, central, or diffuse disease,

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with manifestations in the muscles and joints (Table I). Often, some unrelated complication accelerates the gradual depletion of the aged patient and aggravates the complaints and disability (Table II). As a total effect of these disturbances and their symptoms, inadequate function or "failure" of the musculoskeletal system results.

TABLE I

ETIOLOGIC CLASSIFICATION OF MUSCULOSKELETAL INADEQUACY AND FAILURE

1. *Inflammatory and post-inflammatory states*
   - Acute, subacute and chronic joint diseases
   - Irreversible structural modification after activity subsides, as in rheumatoid arthritis, ankylosing spondylitis, or infectious arthritis
2. *Progressive postural and mechanical defects and distortions*
   - Congenital (skeletal anomalies, etc.)
   - Post-traumatic (fractures, etc.)
   - Static (kyphoscoliosis, etc.)
3. *Metabolic disorders*
   - Gout, Paget's disease, rickets, senile osteoporosis, etc.
4. *Degenerative disorders*
   - Osteoarthritis, arteriosclerosis, etc.
5. *Neuromuscular and C.N.S. disease*
   - Muscular dystrophies and atrophies
   - Myasthenia gravis, Parkinsonism, tabes, poliomyelitis, cerebrovascular accidents, etc.
6. *Neuropsychiatric conditions*
   - Psychoses, hysteria, neuroses
7. *Idiopathic—"senile myasthenia"*

From the practical functional standpoint, any organ of the body may become inadequate and "fail" owing to various causes. The incompetence of the musculoskeletal system to carry out its task of locomotion or work, due to inherent pathologic or physiologic changes or disturbed body mechanics, may just as properly be termed musculoskeletal failure. Here "failure" implies

TABLE II

SOME CONDITIONS SIMULATING OR COMPLICATING ARTHRITIS IN THE ELDERLY PATIENT

Cardiovascular
- Angina pectoris
- Coronary sclerosis and myocardial infarction
- Cerebrovascular accidents
- Peripheral vascular disorders
  - Vasomotor disturbances
    - Raynaud's syndrome
  - Obliterating arterial disease, usually arteriosclerotic
  - Phlebothrombosis and thrombophlebitis

Metabolic bone disease
- Paget's disease
- Osteoporosis, senile (spinal)

Malignant involvement or metastases from
- Multiple myeloma, prostate, breast, thyroid, bronchogenic, hypernephroma, etc.

Neurologic
- Neuralgias and neuropathies
- Combined sclerosis
- Arteriosclerosis of C.N.S.

Psychogenic disturbances
- With localized or diffuse somatic conversion

the inability to perform the usual functions of daily living and of work with the accustomed efficiency. Musculoskeletal failure, like failure in other parts of the body, is frequently a terminal stage. It reflects the inadequacy of these structures and it is apt to be cumulative. It may or may not be a reversible process, depending upon the underlying cause and the alterations of tissue. This consideration is very important in prognosis and in any therapeutic program prescribed.

ETIOLOGY

MUSCULOARTICULAR inadequacy and failure are observed in the elderly most commonly as an end stage of osteoarthritis. Many theories have been postulated as to the etiology of osteoarthritis. Although unknown biochemical processes must play at least an important contributory role, the most generally accepted concept of causation is the mechanistic theory of "wear and tear." Minute repeated traumata to the joints as the result of obesity, skeletal disease, localized structural abnormalities, poor body mechanics, or occupational strain may cause this "wear and tear" of supportive tissues and articular structures. In some individuals the ordinary stresses of routine function, by virtue of predisposing hereditary or endocrine factors, may serve as similar cumulative traumatic or degenerative forces. These, after a time, produce loss of elasticity and fibrillation of the joint cartilage and subsequent compression and vascularization of the subchondral bone.[2] Gradual development of synovial changes, osteophytes, bone cyst formation and narrowing of the joint space takes place.[3, 4] The role of metabolic factors, endocrine or biochemical, systemically or in the local tissues, remains to be explored.

In many patients, the musculoarticular system is enabled to remain compensated for some time at least by undergoing the above pathologic alteration. In others, there is progressive disturbance of the joint mechanics, further cartilage destruction and osseous changes, with resultant articular deformity and the production of a joint which is incapable of performing its functions. Musculoarticular failure then consists of functional impairment arising from the increasing pathologic changes, together with the ensuing unbalanced articular mechanics and limited mobility.

There is a well-known disproportion between the frequency of patients showing osteoarthritic changes of articulations at necropsy or in roentgenograms and the number who actually develop complaints from such arthral degeneration. Of those individuals presenting articular symptoms resulting from osteoarthritic changes, few advance to the stage of musculoskeletal failure.[5, 6] With the degenerative alterations of joint structures may be associated extensive muscular and localized complaints. Brown atrophy may be found in the muscles, or degeneration of their connective tissue stroma. Repeated clinical observations indicate that these changes, in certain cases of osteoarthritis, may keep the musculoarticular system from compensating itself, by not allowing enough muscular support to damaged and poorly aligned joints.

Specific neurologic entities among the muscular dystrophies and atrophies, such as amyotrophic lateral sclerosis, poliomyelitis, and paraplegia from various causes, exhibit the functional features of musculoarticular inadequacy and failure. In time they may develop associated degenerative joint changes. Each of the disease states in this group constitutes a special problem. The symptoms and course are determined by the initial disease and, naturally, are different from those of the arthritides. Prolonged abnormal positions of limbs, disturbed body mechanics and their secondary articular alterations in these conditions enhance or contribute the resulting musculoskeletal failure.

THE CLINICAL picture of musculoskeletal inadequacy and failure has been observed by us at times in elderly patients who do not reveal any of the etiologic factors listed in Table I nor any clinically demonstrable underlying basis. These cases are characterized by generalized weakness and debility, usually with pain and disfunction, especially at the weight-bearing joints. The roentgenograms show minimal or no osteoarthritis. We are presented here with apparently primary diffuse weakness and stiffness of the musculoarticular system, as yet without any of the specific diagnostic characteristics of the established entities listed in Table I. When these patients become bedridden for some reason, rapid and disabling progression of the symptoms may occur, as Thomson has noted also.[7] This group, for the present, is classified by us as idiopathic and may well be termed "senile myasthenia." In the light of recent developments, the condition may arise from some undiscovered biochemical or hormonal deficiency or aberration.

Of course, many systemic and local diseases may lead to the progressive deterioration and pathologic changes producing musculoarticular failure. They may be classified according to etiology, as in Table II. Inadequacy of the locomotor system depends on the amount of organic change in the musculoarticular, skeletal and/or neuromuscular structures, the general physical condition of the aged patient, and the psychic state. The resulting functional impairment may be graded according to the recently outlined categories adopted by the American Rheumatism Association[8] (Table III). This classification of musculoarticular function illustrates the progressive steps to failure. Classes 3 and 4 signify musculoskeletal failure; class 2 implies inadequacy. This grouping can apply to musculoarticular failure

TABLE III

FUNCTIONAL CLASSIFICATION OF MUSCULOARTICULAR INADEQUACY AND FAILURE

Class I	Complete functional capacity with ability to carry on all usual duties without handicaps.
Class II	Functional capacity adequate to conduct normal activities despite handicap of discomfort or limited mobility of one or more joints.
Class III	Functional capacity adequate to perform only little or none of the duties of usual occupation or of self care.
Class IV	Largely or wholly incapacitated with patient bedridden or confined to wheel-chair, permitting little or no self care.

(From the Therapeutic Criteria of the A.R.A.)

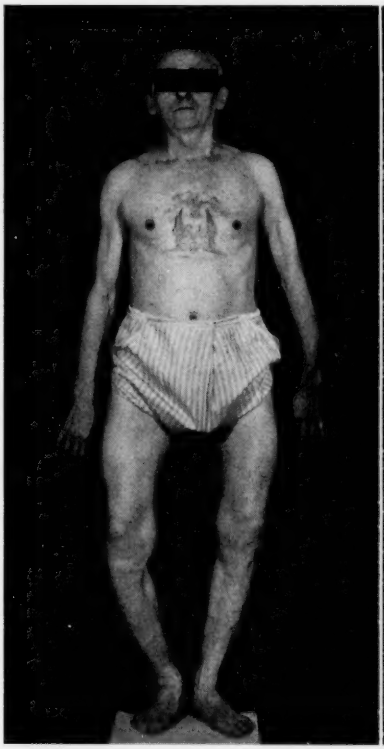

Fig. 1. A 62-year-old watchman with Paget's disease, weak feet and increasingly disturbed body mechanics; localized musculoskeletal pain and slight disability (Class 2).

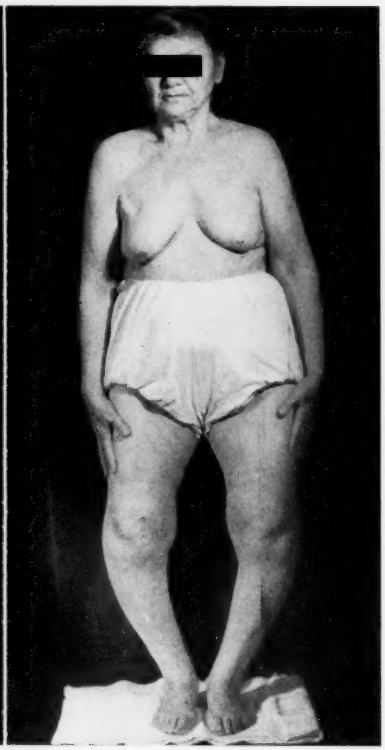

Fig. 2. A 63-year-old woman with long-standing neurotrophic arthropathy and degeneration at the knee joints; progressive pain, deformity and disability (Class 3) due to structural changes.

from any cause. As examples, rheumatoid arthritis, infectious arthritis with ankylosis, or such conditions as periarteritis nodosa or lupus erythematosis disseminata may be classified functionally on this basis.

SYMPTOMS

In musculoarticular inadequacy and failure, many of the symptoms depend upon the extent and location of locomotor impairment and the resulting functional incapacity. Patients in class 1 may have little or no complaint, although they present obvious clinical features and considerable radiologic changes peculiar to the etiology. The common occurrence of chronic symptoms is typical of the osteoarthritic group in which they develop insidiously. There may be some articular stiffness or crepitation of the weight-bearing joints. In spite of slight pain or disability, there is no loss of function.

As a result of the continuing proliferative joint changes, some joint deformity develops, together with limitation of motion. The patient fits into class 2 when, in spite of restricted motion, he can continue to work and attend to the usual activities of daily living. There may be considerable pain on motion due to irritation of the nerve roots or secondary periarticular changes. Since the patient can meet the functional needs of daily life, nevertheless, he still fits into class 2.

WHEN cases present greatly limited functional capacity they are placed in class 3. Patients then are able to conduct only little or none of the previous activities and functions of employment, housework, or self-care. They may be able to walk merely a few steps or get about with supports. Progressive deformity with limitation of motion at the knees and/or hips may make locomotion a process of waddling along on bent rigid knees or with a twisting motion at the hips. Rising from a chair may be done with considerable difficulty. Only a portion of the musculoarticular system may be in failure, particularly one or more of the weight-bearing joints. For example, the knees may be inadequate for weight-bearing to produce this picture, even when there is little impairment of the shoulder, spine or hands.

In cases with such progressive restriction of motion as to cause inability to sit or walk, we are dealing with class 4—the terminal stage of musculoarticular disease. Here failure is so extreme as to cause invalidism. The patient may be confined to bed or limited to a wheelchair existence.

THE MANAGEMENT OF MUSCULOARTICULAR DISORDERS IN THE AGED

THE TREATMENT of these conditions consists of a systematic program of certain tried and effective basic therapeutic measures supplemented by specific agents when they are indicated for particular diseases. Some of the many primary and secondary sources of musculoskeletal failure listed in Table I require special treatment, in addition to the basic therapeutic procedures useful in all of them. We can only consider here the management of the arthritides, with reference chiefly to osteoarthritis.

Specific Treatment

THE IDEAL treatment of musculoarticular failure would be therapy designed to eliminate the cause. In many cases this is not possible as yet, because we are dealing often with conditions of unknown etiology or without specific therapy. When a definite basis can be established and a reversible process is present, specific agents should be used, i.e., colchicine and salicylates, possibly anterior pituitary corticotropic hormone, for gout;[9a and b] prostigmine for myasthenia gravis; antiluetic therapy in tabes; probably Compound E or anterior pituitary corticotropic hormone in rheumatoid arthritis. A radically new approach to the treatment of musculoarticular disease has been opened

up by recent developments in the application of adrenocortical and pituitary substances.[10] The place of these compounds or of other related steroids under investigation in the therapy of so-called degenerative disease eventually may be shown to have specific indications. Regardless of etiology, musculoarticular failure generally responds to certain basic therapeutic measures as exemplified by osteoarthritis. These will now be discussed.

Basic Therapy: Rest

EITHER complete bed rest or daily rest periods may be necessary in the management of the aged arthritic. A local form of rest is applied to an affected part by means of supports. As in congestive heart failure, a trial period of bed rest may prove very valuable for severe and unresponsive cases of muscle and joint disease. Most elderly patients presenting the picture of chronic musculoarticular inadequacy and failure are tired because they have been driving themselves to function in as nearly normal a pattern as possible. Rheumatic disorders are known by the laity not to be fatal, so the fear of serious consequences does not act as a deterrent. These patients usually have had various forms of treatment in the past, often consisting of vigorous courses of medical and physical therapy.

It is likely to be useless to attempt other active treatment until they have had a chance to gain strength. The greatest service that can be rendered these individuals is to explain the futility of their wanderings from doctor to doctor and clinic to clinic seeking some magic remedy in the form of a pill or an injection. When a period of bed rest is indicated, it is important that while resting in bed the range of motion at joints is preserved by combining the judicious use of exercises.[11] A most important basic therapeutic consideration in chronic musculoskeletal disease is the proper balancing of rest and exercise.

Analgesics

SALICYLATES are prescribed in sufficient dosage for relief of pain and muscle spasm, 5-15 gr. q. 3 h., with equal amounts of sodium bicarbonate if required. Codeine or demerol for the relief of acute episodes may be required for several days.

Constitutional Treatment

AN ADEQUATE diet must be designed for the individual's requirements and her disease. It is especially desirable to correct underweight or obesity. A balanced diet of suitable caloric content is prescribed. Supplementary vitamins are indicated for any definite nutritional deficiency. Dietary modifications are made for any gastrointestinal or metabolic complication.

Orthopedic Aids and Procedures

IT IS helpful to determine whether the pathology is reversible, partially reversible, or irreversible. If reversible or partly so, appropriate measures

should be undertaken. Postural and mechanical defects may be adequately overcome by the use of exercises and supports.

Orthopedic measures should be employed at any age to prevent further deformity, to correct malposition of limbs, to relieve pain and restore function.[12] Ordinary aids consist chiefly of elastic bandages, straps, splints, crutches, and braces. Common and simple surgical procedures to overcome deformity are: skeletal traction, splints, tenotomy, osteotomy, synovectomy, and plastic repairs. To regain some motion in selected cases arthroplasty may be useful, or to relieve pain and disability arthrodesis and neurotomy may be carried out. The increasing resources of modern surgery make it unfair to condemn a joint or a patient to hopeless disability without the opinion of a specialist.

Physical Medicine and Rehabilitation

PHYSICAL therapy modalities and functional occupational therapy are used, among other purposes, to allay discomfort, increase or restore muscle tone and strength, aid joint mobilization, and improve coordination. When combined with other techniques of rehabilitation, physical modalities give much more valuable aid than when used alone. Diathermy, ultra-violet radiation, the hot tub, whirlpool baths, the Hubbard tub, and massage have their place when indicated.[6]

In conjunction with physical measures, exercise is most effective. Its purpose is to increase endurance, to strengthen weakened muscles in order to make the best possible use of supports, to preserve and enhance mobility, and to bring back normal tonus and function. Properly used passive, assistive, active and resistive exercise contributes the simplest, most beneficial and least appreciated therapeutic aid in the musculoarticular disorders. Massage may be carried out with assistive exercises, provided that infectious or inflammatory disease is not present or no complication contraindicates it. Graduated exercises starting with assisted and active motions should be done regularly. The amount and duration of such activity are regulated by prescribed movements, according to the capacity of the elderly patient. Pain, soreness or spasm lasting more than an hour afterwards indicates overuse of the part. Underwater exercises are helpful to those with severe or extensive involvement. Resistive exercises may be designed to strengthen particular muscle groups. Useful apparatus, to permit special muscular and articular movements in bed, may be provided by pulleys, ropes or overhead traction from a Balkan frame in particular cases.

MANY patients with musculoskeletal inadequacy and failure present problems of rehabilitation, especially when the changes are in the irreversible stage. They require study from the viewpoint of ability to perform the daily tasks of life. The goal of rehabilitation of an individual with musculoarticular failure who is confined to bed may be relatively limited, sometimes only to the point of a wheelchair existence. A complete check of muscle strength, measurement of range of motion and the ability to perform the tasks of daily

living are necessary then to get an accurate gauge of functional grade and capacity. For example, can the patient comb his hair or brush his teeth; is he able to get from the bed to the chair, to the toilet, or to dress himself? The next step, after determining the ranges of articular motion and the limits of muscular capacity, as measured by the ability to perform the necessary tasks of living, is to try to increase the number of duties the patient can carry out by making use of the remaining muscle power.

FOR THOSE with severe disabilities, re-education in the use of muscles for the necessary functions of daily living or for a new means of livelihood may be required. In certain conditions, such as hemiplegia or arthritis with severe disability, re-education of muscles, functional occupational therapy, vocational training and psychologic reorientation may completely change the outlook in an otherwise drab and hopeless future. Such a program can only be carried out by trained personnel whose skills and facilities must be available. During the period of rehabilitation, diversional occupational therapy can be used to improve morale and prevent boredom. The patient should be taught to perform the different manual skills while wearing any necessary supports. Various types of occupational therapy should be tried, especially those requiring motion in affected joints, in order to best prepare the patient for performance of household duties or employment.

SUMMARY

1. For reasons discussed, there is a noticeable increase in the frequency of diagnosis of rheumatic disorders in the aged.
2. These diseases constitute one of the common causes of disability among patients in the older age groups.
3. The concept of "musculoskeletal inadequacy and failure," like inadequacy and failure generally recognized in visceral disease, is presented.
4. The importance of such a concept in the management of arthritis and other sources of musculoskeletal failure in the later decades is increased by the great number of aggravating complications and causes of depletion, known and unknown, among the elderly.
5. Idiopathic musculoarticular inadequacy and failure, or "senile myasthenia," encountered occasionally, with clinical features similar in many respects to those of the established entities, is briefly outlined as a possible symptom-complex due to some biochemical or hormonal deficiency or aberration.
6. The basic therapeutic program and the use of specific complements are summarized.
7. The importance of rest and controlled activity in musculoskeletal inadequacy and failure is emphasized.

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*International Variations of Longevity**

Great contrasts in longevity records are observed among the countries of the world.

The best records for longevity are found in the English-speaking and Scandinavian countries. New Zealand is the highest of these countries, the expectation of life at birth in that country being 67.0 years in 1934-1938, about five years more than in the United States at that time.

Eastern Europe and most of the Latin American countries hold an intermediate position with respect to average length of life. Mexico showed an expectation of life of only 33.3 years in 1930. This figure is about the same as for the United States at the time of its founding.

The poorest record for longevity is found in Asia and Africa. India in 1931 had an expectation of life of slightly less than 27 years, not much higher than that estimated for Rome 2,000 years ago. For Egypt the figure was 38.6 years in 1936-1938. On the other hand, in pre-war Japan the average compared favorably with that for Eastern Europe.

Encouraging progress has been made in increasing longevity since the turn of the century. In Chile for example, the rise in expectation of life was more than 10 years between 1919-1922 and 1939-1942.

*Statistical Bulletin of the Metropolitan Life Insurance Company 31, No. 3, March, 1950.

Unipolar Precordial and Limb Lead Electrocardiograms in the Aged

P. H. Wosika, M.D.,* *E. Feldman,* M.D.,*
E. J. Chesrow, M.D.,* *and G. B. Myers,* M.D.*

THE NEED for statistical data on the electrocardiographic findings in the aged has not been met by previous reports,[1-7] because of wide variations in age limits of the subjects, an insufficient number of leads and lack of uniformity in the criteria employed. Most of the reports have been based on a study of leads I, II, III and IV F,[1-5,7] now known to be inadequate for a proper evaluation of the ventricular electrocardiogram. This study presents an analysis of the findings in Wilson precordial leads and in standard and unipolar limb leads obtained on 100 consecutive patients over 80 years of age, who were institutionalized at Oak Forest Infirmary or hospitalized at Illinois Masonic Hospital. The youngest patient was 80 years old and the oldest was 103, the average age being 84.2 years. Selection of patients was not influenced by their cardiac status, and both ambulatory and nonambulatory subjects were used. Fifty-five patients were male and 45 were female.

A physical examination was performed on each patient with an evaluation of the cardiovascular system as the primary aim. Ninety patients had 2 meter roentgenograms of the chest. Each patient had an electrocardiogram in the supine position using 12 leads routinely: standard leads I, II, III, unipolar limb leads aV_L, aV_R, aV_F, and precordial leads V_1 to V_6 inclusive. The latter were extended to the right: V_{3R}, V_{4R}, V_{5R}, V_{6R}; and, to the left: V_7, V_8, V_9 whenever necessary.

THE CRITERIA for interpretation of standard leads were those of accepted, authoritative sources.[8-11] The unipolar limb and precordial leads were interpreted according to the method of Goldberger,[12,13] and of Myers, et al.[14] The criteria for normality of unipolar precordial leads are based on a series of 52 autopsied cases investigated by Myers and his associates;[14] one case in this series was over 80 years of age, the group as a whole ranging from 19 to 87 years of age.

Incidence of normal and abnormal electrocardiograms (Table I). Twenty patients (nine men and eleven women) of the 100 had normal electrocardiograms. One patient in this group had sinus arrhythmia and six patients had

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TABLE I

ELECTROCARDIOGRAPHIC DIAGNOSES

NUMBER OF NORMAL AND ABNORMAL ELECTROCARDIOGRAMS AND INCIDENCE OF ABNORMALITIES ENCOUNTERED.

	INCIDENCE No.	Total
Normal electrocardiograms		20
Men	9	
Women	11	
Normal sinus rhythm		70
Abnormalities of rate and rhythm		62
Isolated premature auricular systoles	20	
Isolated premature ventricular systoles	10	
Isolated premature nodal systoles	1	
Sinus bradycardia	6	
Sinus tachycardia	4	
Sinus arrhythmia	12	
Wandering sinus pacemaker	2	
Auricular fibrillation	7	
Conduction defects		51
Prolonged A-V conduction time	29	
Complete A-V block	4	
Right bundle branch block	8	
Complete	7	
Incomplete	1	
Left bundle branch block	4	
Intraventricular conduction defects	6	
Ischemic lesions		21
Myocardial ischemia	7	
Definite	2	
Suspect	5	
Myocardial infarction	14	
Acute	4	
Healed	6	
Suspect	4	
Hypertrophy and Dilatation		34
Left ventricular hypertrophy	31	
Definite	20	
Suspect	11	
Right ventricular hypertrophy	1	
Auricular hypertrophy	1	
Right ventricular dilatation	1	
Digitalis effect		1

isolated premature auricular or ventricular systoles, which were considered of no clinical significance. Fifteen of these 20 patients were clinically free of cardiovascular disease, one had hypertensive cardiovascular disease, and four had arteriosclerotic heart disease with anginal syndromes in three cases. Cardiac enlargement was found radiologically in two cases, and cardiac failure was present in one case. Eighty patients had abnormal electrocardiograms but 35 of these were considered clinically free of cardiovascular disease. This is in agreement with previous investigators who found that many of the aged patients who were considered clinically normal for their age had abnormal electrocardiograms.

Cardiac position (Table II). Cardiac position was determined from the precordial and unipolar limb leads according to the method of Wilson[15] and compared with the axis in the standard leads. In one case the heart was

in a vertical position and the tracing normal. Of the 21 instances of no axis deviation, three were vertical, seven were semivertical, 10 were intermediate and one was semihorizontal. Of the 62 instances of left axis deviation, 10 were intermediate, 24 were semihorizontal and 28 were horizontal. Sixteen of the 62 tracings with left axis deviation were perfectly normal and seven additional tracings showed first degree heart block as the only abnormality. Twenty-five of the 62 tracings with left axis deviation showed left ventricular hypertrophy. The fact that 16 patients with left axis deviation had otherwise normal electrocardiograms re-emphasizes that left axis deviation *per se* is not an indication of pathology but may only be a reflection of cardiac position.

TABLE II

RELATION OF AXIS DEVIATION TO CARDIAC POSITION (EXCLUDING ALL BUNDLE BRANCH BLOCKS).

Cardiac Position	Right Axis Deviation	No Axis Deviation	Left Axis Deviation	Total
Vertical	1	3		4
Semivertical		7		7
Intermediate		10	10	20
Semihorizontal		1	24	25
Horizontal			28	28
Total	1	21	62	84

Cardiac Rate and Rhythm. Seventy patients had normal sinus rhythm, six had sinus bradycardia, four had sinus tachycardia, 12 had sinus arrhythmia and two had wandering sinus pacemaker. Isolated auricular premature systoles were found in 20, ventricular premature systoles were found in 10, and nodal premature systoles in one. Auricular fibrillation was present in seven cases.

Conduction defects: prolongation of the auriculoventricular conduction time. Prolongation of the A-V conduction time was a common abnormality, occurring in 29 cases. The longest PR interval was usually seen in standard lead II, lead aV_R or leads from the right precordium. The prolonged PR was the only abnormality in 13 tracings. In 14 instances the PR interval was from 0.21 to 0.22 sec.; in five tracings it was over 0.22 and up to 0.24 sec.; in four it was over 0.24 and up to 0.26 sec.; in two it was over 0.26 and up to 0.28 sec.; in three it was over 0.28 and up to 0.30 sec.; and in one case the PR interval was 0.3 sec., this being the longest PR encountered.

Conduction defects: complete block. Complete A-V block with idioventricular rhythm was found in four subjects. It was possible to interpret these tracings as complete heart block with A-V nodal rhythm and bundle branch block. The QRS complexes conformed with the pattern of right bundle branch block in two, and left bundle branch block in the other two.

Conduction defects: bundle branch block. Right bundle branch block

was diagnosed in seven cases from the following criteria: (1) QRS interval of 0.12 sec. or longer in complexes derived from an impulse of sinoauricular origin and associated with a PR interval of 0.12 sec. or longer; (2) an initial relatively broad upstroke in all leads facing the epicardial surface of the right ventricle due to early positivity of the right ventricular cavity; (3) a late secondary upstroke in the same leads due to delayed activation of the free wall of the right ventricle.[12,15,16,17]

One patient had incomplete right bundle branch block as judged by the following criteria: (1) a QRS interval 0.10 to 0.11 sec.; (2) registration of a double peaked R wave with intervening notch or S wave in leads from the right precordium (this point is made to prevent confusion with the RSR' pattern caused by conus activation and seen in leads from the C_2 position) (figure 1); and (3) other criteria similar to those for complete right bundle branch block.

In one patient with complete right bundle branch block, abnormal Q and T patterns diagnostic of anterolateral infarction extending into the septum

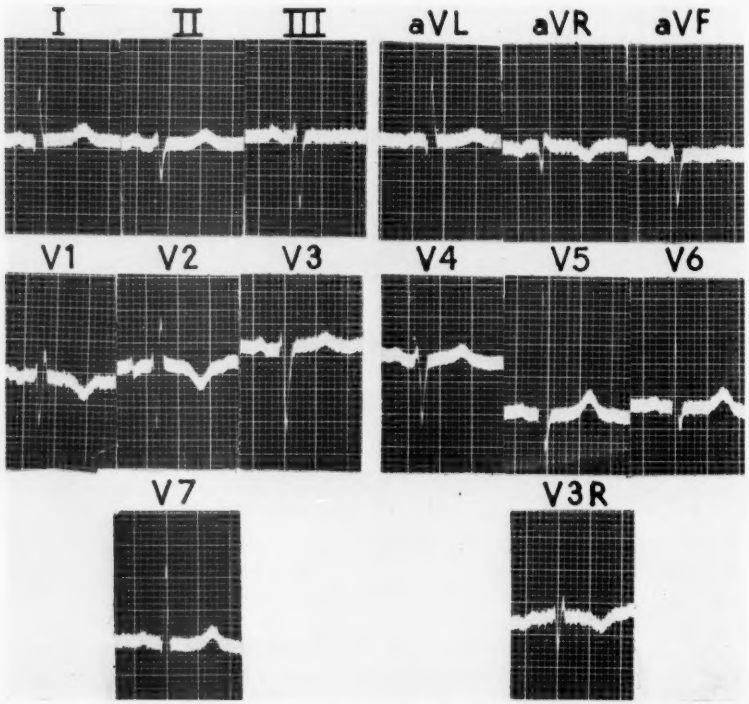

FIG. 1. Normal electrocardiogram, heart in horizontal position. The increasing height of R' from right to left results from conus activation.

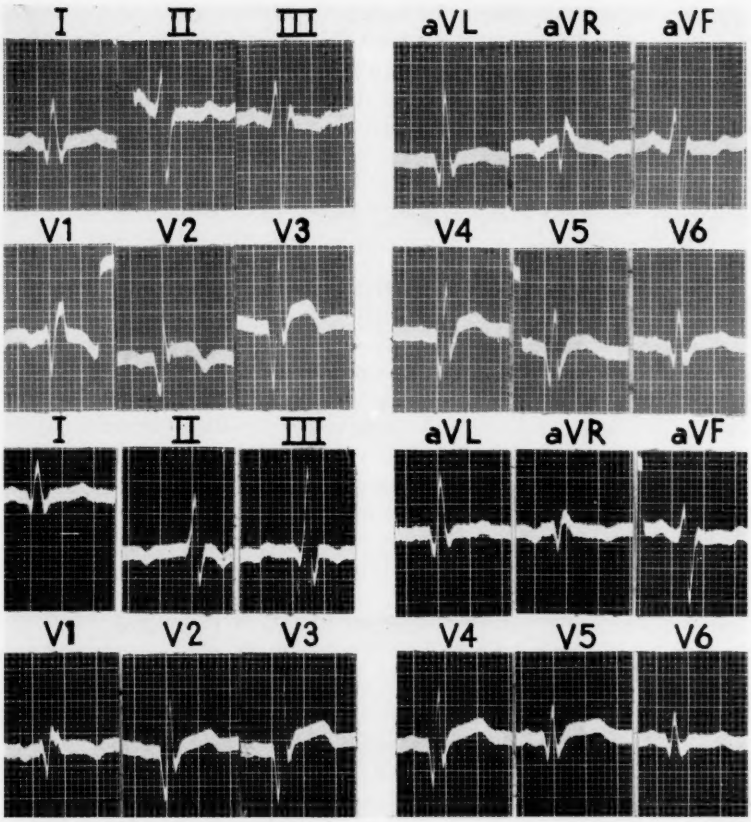

FIG. 2. Infarction occurring in the presence of right bundle branch block. No changes indicating infarction can be seen in the standard leads.

were found in multiple precordial leads but not in the standard limb leads (Figure 2).

In two cases of complete right bundle branch block there was also evidence of left ventricular hypertrophy. This consisted of prolongation of the QR interval over 0.05 sec. in leads over the left ventricle. The initial Q in leads over the left ventricle is due to septal activation—the impulse going from left to right due to earlier stimulation of the left side of the septum—and is not influenced by the presence of right bundle branch block. The QR interval can, therefore, be used as a criterion of left ventricular hypertrophy as in cases without right bundle branch block, provided that subendocardial anterolateral infarction is not present. No evidence of left ventricular hypertrophy could be seen in the standard leads of these two cases.

There were four instances of complete left bundle branch block according to the following criteria: (1) a QRS 0.12 sec. or longer in complexes from S-A node impulses, and associated with a PR interval of at least 0.12 sec.; (2) initial upstroke in all leads facing the epicardial surface of the left ventricle representing early positivity of the left ventricular cavity; (3) broad, notched, or slurred R with abnormally delayed intrinsicoid deflection in the same leads caused by late arrival of the impulse at the epicardial surface of the left ventricle; (4) complexes from left ventricular leads characterized by depression of the RS-T junction, upward convexity of the RS-T segment, and sharp inversion of the T wave.[12,15,17]

There were six tracings which showed slurring or notching of the complexes in the precordial or unipolar limb leads. In several of these tracings there were Q waves longer than 0.02 sec. in duration in one or more left precordial leads and in lead aV_L if the heart was in a horizontal position. These findings failed to conform to transition zone effects or to other diagnosable patterns and were considered intraventricular conduction defects, probably in the outer wall of the left ventricle.

Ischemic lesions. Abnormal RS-T depression was found in the tracings from two patients and borderline in five others. From the contour of the RS-T segments, myocardial ischemia was considered the most likely diagnosis. No proof, however, was obtained since exercise and anoxia tests were not attempted.

Myocardial Infarction. In four patients serial electrocardiograms proved the presence of acute myocardial infarction classified as anterolateral in two, anteroseptal in one and posterior in the other.[18-21] The first mentioned infarct occurred in a patient in whom right bundle branch block was present (Figure 2). Healed infarctions were encountered six times. In four other cases the pattern was compatible with but not pathognomonic of healed infarction.

Hypertrophy and Dilatation. Left ventricular hypertrophy was diagnosed according to the following criteria:[15,22,23,24] (1) qR complexes in leads facing the epicardial surface of the left ventricle, characterized by a small q measuring 0.02 sec. or less from onset to nadir, followed by a prominent R more than four times the amplitude of the Q, and late intrinsicoid deflection beginning more than 0.05 sec. after onset of the QRS; (2) tendency to depression of the RS-T junction, upward convexity of the RS-T segment, and inversion of the T waves in the same leads; (3) exaggeration of the depth and breadth of the S waves in leads from the right precordium, the time interval from onset of the QRS to the nadir of the S exceeding 0.05 sec. In some instances where the findings in leads $V_{4\text{-}5\text{-}6}$ are equivocal, the qR patterns diagnostic of left ventricular hypertrophy may be found in V_7 and V_8 or may appear in a V_L if the heart is in horizontal position or in $_AV_F$ if in vertical position. Left ventricular hypertrophy was diagnosed in 31 tracings, 20 definite and 11 borderline. Signs of left ventricular hypertrophy were present in aV_L but not in the precordial leads in nine cases.

If leads at the chest positions 7, 8 and 9 had been taken routinely it is probable that additional tracings would have shown evidence of left ventricular hypertrophy. There was one case of auricular hypertrophy, one case of right ventricular dilatation and one case of right ventricular hypertrophy, the criteria for the latter being: (1) an abnormally long time from onset of QRS to the peak of the R in V_1, amounting to 0.03 sec. or longer; (2) reversal of the ratio of the amplitude of the R and S waves in lead V_1 and V_6; (3) tendency to a small q wave in lead V_1; (4) tendency to inversion of the T wave in V_1 and upright T wave in V_6; (5) a QRS of less than 0.12 sec.[15,16,23,25]

DISCUSSION

Levitt[1] studied 100 men and women over 70, carefully screened to exclude cardiovascular disease. Eighteen of these were over 80 years of age. Only standard leads I, II, and III are mentioned. He found 26 abnormal electrocardiograms, six of which were in patients 80 years of age or more. Certain electrocardiographic changes were considered normal. These changes were: tendency to horizontal position, lowered voltage, lowered T waves and increase in duration of the QRS and PR intervals.

Eliaser and Kondo[2] studied a group of 100 men and women over 70 years of age, among whom 26 patients were over 80, using standard leads I, II, III, plus lead IV_F. They found 15 normal electrocardiograms but did not consider left axis deviation, prolonged AV conduction time, low voltage, or inverted T waves as abnormalities in the aged, although these changes would be considered abnormal among young individuals.

Fox, Klements and Mandel[3] studied 300 ambulatory males and females from 60 to 100 years of age, using standard leads I, II, III and IV_F. Eighty-nine cases were over 80 years of age. They found 200 abnormal tracings but considered premature contractions, high or low voltage, and sinus arrhythmia as abnormalities. Many of the patients with abnormal electrocardiograms were clinically free of cardiovascular symptoms.

Taran and Kaye,[4] in a study of 102 men and women 60 to 90 years of age (29 patients were over 80), avoiding patients with cardiac complaints, found that 75 per cent had left axis deviation, 17.6 per cent had conduction disturbances, and 46.5 per cent had myocardial damage, the total number of abnormal tracings amounting to 64 per cent of the series. Standard leads I, II, III plus lead IV_F were used. They concluded that elderly patients may have abnormal tracings without cardiovascular symptoms.

Fox, Weaver and Francis[5] investigated 300 males 60 to 90 years of age (61 were over 80) clinically, fluoroscopically, and electrocardiographically, using standard leads I, II, III and lead CF_4. They found 152 normal tracings but considered premature contractions and sinus arrhythmia abnormal. The incidence of abnormal electrocardiograms was found to increase with

age. They concluded that the abnormal electrocardiogram in the aged is a function of age, diastolic hypertension, and cardiac enlargement.

Dolgin et al[6] studied 71 cases, the majority of which were between 70 and 85 years of age. Standard leads I, II, III and chest leads CF_2, CF_4 and CF_5 were employed. Fifty-five patients had heart disease but only 20 had diminished cardiac reserve. The remainder were diagnosed by fluoroscopy or electrocardiogram, 11 solely on the basis of the electrocardiogram. Sixty-eight per cent of the entire group had abnormal electrocardiograms. They conclude that the majority of people in the eighth and ninth decades have a relatively benign form of heart disease.

McNamara[7] investigated 100 men and women over 70 years of age using standard leads I, II, III and CF_4. Thirteen cases were 81 years of age or over. Cases were selected on the basis of absence of cardiorespiratory symptoms, cardiac enlargement or hypertension. Low voltage, premature contractions and sinus arrhythmia were considered minor abnormalities. Thirty per cent had minor abnormalities, 31 per cent had abnormal tracings and 30 per cent had normal tracings. Discounting low voltage and premature contractions as abnormalities, 70 per cent had normal tracings. Thus, in the group over 80 years of age, there were twice as many normal as abnormal electrocardiograms.

When a comparison of the interpretation of the multiple lead electrocardiograms with the standard leads and one chest lead (V_4) was attempted in the present series, major discrepancies were noted between the two interpretations, particularly in infarction and hypertrophy. Left ventricular hypertrophy was diagnosed 31 times from the multiple leads. In 11 instances the findings were considered borderline, but in the remaining 20 instances a definite diagnosis of left ventricular hypertrophy could be made. When the interpretation of these 20 tracings was limited to four leads, 10 tracings were diagnosed as "left heart strain" according to accepted methods,[9] and 10 tracings were either normal or gave no indication of the underlying hypertrophy. The one case of right ventricular hypertrophy was diagnosable from the multiple leads, while the standard leads showed left axis deviation (Figure 3). This unusual pattern resulted from the horizontal position of the heart in the chest. In 15 cases which showed "left heart strain" in the standard leads, all showed left ventricular hypertrophy when multiple leads were utilized. In three cases there were alterations in the standard leads (Q_2 and Q_3 pattern) suggestive of posterior myocardial infarction. Lead aV_F showed the changes in these three cases to be positional rather than due to infarction.[26] Of 10 cases in which definite myocardial infarction could be diagnosed from multiple leads, four showed no evidence of infarction when interpretations were limited to four leads, and six, although indicative of infarction, did not give evidence of the interventricular septal involvement present.

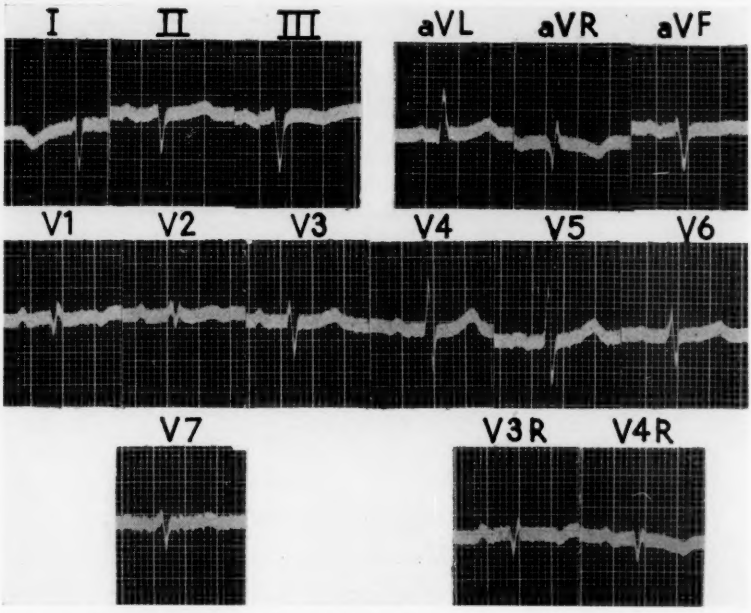

FIG. 3. Right ventricular hypertrophy in a semihorizontal heart showing left axis deviation.

Thus, the higher incidence of significant abnormalities in the present series, though in part due to the increased age, must be attributed to the larger number of leads utilized in this study.

SUMMARY

Multiple Wilson precordial V leads and Goldberger limb lead electrocardiograms, in addition to standard leads, were obtained upon 100 patients 80 years of age or older. The number of leads (minimum of 12) employed and the age of the patients (average 84.2 years) is greater than in previously reported studies.

Twenty patients had normal electrocardiograms; 15 of these exhibited no clinical evidence of cardiovascular disease; four showed arteriosclerotic heart disease; and one had hypertensive cardiovascular disease. On the other hand, 30 patients, considered normal on clinical grounds, had abnormal electrocardiograms.

The electrocardiographic abnormalities are tabulated, the largest groups being: left ventricular hypertrophy, 31 per cent; prolonged auriculoventricular conduction time, 29 per cent; myocardial infarction, 14 per cent; bundle branch block, 12 per cent.

Left axis deviation was present in 62 cases, but was not accompanied by any abnormalities in QRST pattern in 16 of these. This finding reemphasized the fact that left axis deviation *per se* is not an indication of pathology, but may only be a reflection of semihorizontal to horizontal cardiac position.

A comparison of the interpretations based upon the six precordial and six limb leads with those made independently from the three standard limb leads together with V_4, showed many instances where abnormalities were diagnosable from a study of multiple leads, but, not from the three standard and a single precordial lead, particularly in ventricular hypertrophy and myocardial infarction.

The higher incidence of significant abnormalities in this group than in previously reported series may have been due in part to the older age of the patients but was also attributable to the use of multiple precordial leads and unipolar limb leads.

The authors wish to thank Mrs. J DeVos, Mrs. B. Heninger, and Miss J. Sobiski for their expert technical assistance.

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*Skin Disorders in the Elderly**

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Dermatologists are confronted with an ever-increasing number of problems which arise out of the aging process. Skin diseases are both more common and severe in the aged.

Hyperkeratosis is the most frequent lesion in patients past age forty and like basal and squamous cell carcinoma, its incidence doubles after age sixty. Treatment consists of surgery and electrodesiccation. X-ray or radium may be more satisfactory for the very aged or debilitated patient.

Contact dermatitis represents the second most frequent condition. Mouth lesions also increase in the sixty plus age group. Infectious eczematoid dermatitis, usually secondary to some pre-existing disease, is another difficult geriatric problem. Penicillin intramuscularly sometimes works well. Sulfur precipitated four per cent in Lasser's zinc paste applied twice daily is effective, as are bacitracin or aureomycin ointment or sulfadiazine orally.

In general aged skin exhibits uniform thinning of the epidermis, fragmentation of the corium collagen fibers and swelling, clumping and basophilia of the elastic fibers.

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The Treatment of Leukoplakia and Kraurosis Vulvae*

C. L. Buxton, M.D., Med.Sc.D.

THERE HAS BEEN, and continues to be, considerable confusion in the medical literature concerning the pathological lesions variously designated as leukoplakia, kraurosis vulvae, and senile vaginitis. Actually, leukoplakic vulvitis and kraurosis vulvae affect different areas of the skin and mucous membrane, have a different histological picture, and may well have a different etiology. Many years ago Berkeley and Bonney[1] differentiated these two disease entities and described their characteristics so adequately that their description is well worth quoting.

"Leukoplakic vulvitis," they state, "is to be defined as a chronic inflammatory condition of unknown origin characterized in its early stages by marked hyperemia and cellular activity and in its later phases by marked epithelial hypertrophy, with a thickened, sclerosed and retracted condition of sub-epithelial tissue. Its distribution varies in severity and time of incidence. In a well marked case the whole of the vulva may be implicated with the exception of the vestibule and orifice of the urethra *which are never affected* and not only may the labia majora, minora, anterior and posterior commissure and clitoris suffer, but the disease may even spread laterally to the folds of the thighs and posteriorly over the perineum and skin surrounding the anus." On the other hand: "Kraurosis vulvae consists of an atrophic condition of the vulva associated clinically with stenosis of the vaginal orifice and pathologically with certain changes in the dermis. The labia minora, vestibule or orifice of the urethra and that of the vagina are *always* affected, and the clitoris sometimes. The skin on the outer surface of the labia majora, between the labia majora and folds of the thigh covering the perineum, and surrounding the anus, *are never affected.*" Actually, therefore, leukoplakia is a disease which affects the skin around the vulva, and kraurosis is an atrophic disease affecting the mucous membrane within the boundaries of the labia minora.

THE PATHOLOGY of the two diseases is also quite different. Leukoplakia is characterized by swelling and hyperemia of the epithelium and later by pronounced cellular proliferation of the sub-epithelial tissue. Still later the sub-epithelial tissue becomes fibrotic and basal layers of the epithelium markedly hypertrophied. The continued sclerosis of the sub-epithelial tissue produces the characteristic smooth and shiny white appearance which becomes cracked,

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fissured and ulcerated, especially when the constant trauma of scratching and the presence of secondary infection produces a chronic inflammatory reaction. Kraurosis, however, produces an extremely thin epithelium with atrophic papillae which in many places have almost disappeared. Retention of normal elastic tissue and massive infiltration of white cells of all types are also identifying characteristics. This disease is much more closely akin to simple senile vaginitis and very probably has the same etiology of estrogen depletion. Long before the physiology of estrogens was well known, kraurosis was attributed to ovarian failure, and from a physiological point of view it seems logical that estrogen therapy would have a more beneficial effect on the symptoms of this disease than on those of leukoplakic vulvitis. Kraurosis is, in fact, a descriptive term meaning "a drying up or shrinking" and in the minds of many should be discarded and the term "senile vaginitis" used instead. Many confusing variations of these two terms have found their way into the medical literature in past years. Brewer[2] found eighteen different identifying words for these abnormalities.

THE PROCESS of diagnosis in an individual who complains of pruritis vulvae should certainly include: (1) The identification of, and if possible, elimination of systemic disease, either somatic or psychiatric. Diabetes, of course, must always be considered. Obesity, with its attendant moisture from perspiration and constant rubbing of the inner areas of the thighs, producing intertrigo and chronic irritation, may occasionally be a cause of pruritis. Miller[4] and others identify numerous systemic diseases occurring in individuals complaining of this difficulty. It is questionable, therefore, as to whether these co-existing systemic diseases had any etiological relationship to the leukoplakia itself. (2) Careful evaluation of other local pathology. As has been mentioned, the presence of relaxations resulting in cystocele or urethrocele with accompanying incontinence, may possibly have a very definite etiological effect. Certainly any vaginal discharge may produce a chronic vulvar irritation resulting in pruritis making it important to identify the presence of discharge resulting from cervical erosion or infection by trichomonas vaginalis, monilia, or other non-specific organisms. Exogenous chemical irritants in the form of certain types of douche powders or soaps may occasionally cause vulvar irritation. (3) The determination of the presence of gastric anacidity. Leukoplakia in various parts of the body has been thought to have been due to vitamin A deficiency, and since there is apparently a relationship between gastric anacidity and low plasma vitamin A levels, it may be important to identify from the history and physical examination whether or not the individual is suffering from gastric anacidity. The absence of free hydrochloric acid in the stomach is a very common finding in older people, however, so that its absence in 60 per cent of the individuals suffering from leukoplakia, described by Hyams and Bloom,[3] may not be an important factor.

After eliminating the above causes there will be found a definite residual percentage of patients who have definite local lesions falling within

the described categories of kraurosis or leukoplakia. It is important to differentiate between these two conditions because on a rational basis their treatment should be considerably different. Thus, if kraurosis vulvae is a condition of atrophy of a secondary sex organ, then the therapy for its alleviation might well be estrogen substitution. On the other hand, it does not seem advisable to submit an older woman to such therapy, especially if she has gone through the normal menopause without too much difficulty, and if she is systemically well adjusted to her physiological lowering of blood estrogen level. Although administration of estrogens may alleviate the severe pruritis and discomfort caused by kraurosis or senile vaginitis, the cure may be worse than the disease, putting the patient in a state of estrogen instability with resumption of hot flushes and even a resumption of endometrial growth and artificial menstruation. Estrogen therapy of this type is not indicated, of course, in any individual who has a carcinoma history.

GENERALLY speaking, the use of estrogen salve as an inunction for kraurosis vulvae and senile vaginitis has been quite satisfactory. Several workers[5,6,7,8] have reported series using various kinds of estrogens. It must be remembered, however, that estrogen if applied by inunction in sufficient concentration may have a systemic in addition to a local effect. The estrogen ointment used at the Sloane Hospital for Women consists of a hydrated lanolin base containing 10 mg. of diethylstilbestrol per 30 cc. of ointment. The patients were instructed to apply about 30 cc. of the ointment locally every day for one week. If improvement occurs at all it is usually quite apparent within one week. A much higher dosage than this was used originally in the Sloane Endocrine Clinic, and as a result one of our first patients, a woman over 80, had an episode of vaginal bleeding from actual proliferation of atrophic endometrium. Actual kraurosis or senile vaginitis, however, is certainly susceptible to estrogen therapy, and if a definite diagnosis of this condition can be made, therapy of this type may be considered advisable.

SINCE leukoplakia may occur in individuals who are still menstruating and even in the presence of pregnancy, the problem of estrogen depletion is not thought to be an etiological factor. Many types of therapy have been used in the treatment of leukoplakia, none of which has proved to be highly successful. Believing that the pruritis becomes much more severe as the result of chronic secondary infection and trauma due to itching, Cinberg[9] suggests the use of a bland ointment of white petrolatum with 20 per cent starch and 30 per cent zinc oxide. This is certainly an innocuous procedure, and, since it produces relief of symptoms in some patients, may well be worth a preliminary trial. In the belief that leukoplakia may have as etiological factor a chronic vitamin A deficiency, Hyams and Bloom[3] have treated their patients with 250,000 to 500,000 units of vitamin A daily by mouth, supplemented by 50,000 units twice a week intramuscularly, in addition to 15 minims of dilute hydrochloric acid daily. In 18 patients so treated they found that 14 were relieved of their symptoms.

Possibly the two types of therapy most frequently used for leukoplakia are radiotherapy and surgery. In recent years at the Sloane Hospital for Women 31 cases have been treated with radiotherapy with extraordinarily variable dosages ranging all the way from 100 r to as much as 1800 r. There seems to be no relationship between the amount of dosage used and the result to the patient. Of the 31 cases, nine were cured, 11 improved, six were unimproved and there was no followup in five. In other words, 20 of the 31, or 64.5 per cent, were either cured or improved. During this time 15 patients, a few of whom had previously had radiotherapy, were submitted to surgery consisting either of a simple vulvectomy or of a radical vulvectomy including dissection of the inguinal glands. The more radical operations, of course, were done on patients with either suspected or proven carcinoma. Of the group of 15, one was cured, 12 were improved, one was unimproved and one died several months after operation. In other words, 86.7 per cent of this group of fifteen were either cured or improved.

The value of percentages used to draw conclusions is questionable in groups of this small numerical size, however. Other reported series do not necessarily have such a high percentage of success following surgery. Miller et al[4] report successful results in 35 per cent of a series of 143 patients, of whom 54 were operated upon. Twenty-four per cent of these patients had recurrences. Gynecologists disagree as to the efficacy of surgery for this disease, some feeling that such a mutilating operation should not be carried out if there is any possible way of avoiding it, especially in women still carrying on an active sexual life. Others state that it is perfectly possible to carry out a vulvectomy without eliminating normal vaginal function.

In comparing the merits of surgery with other forms of therapy, the subsequent occurrence of carcinoma in these areas is of significance. According to Taussig,[10] there is an associated presence of carcinoma in 50 per cent of the cases of leukoplakia operated upon, higher than the 23 per cent incidence in the series reported by Miller. Whether or not leukoplakia of the vulva can be considered as a pre-cancerous lesion is a moot point. It is certainly true, however, that carcinoma of the vulva occurs frequently in patients who have been suffering from leukoplakia, and Healy[11] states that he has never seen a case of epithelioma of the vulva which has not had a history of leukoplakia. On the other hand, a five-year follow-up of Hyams and Bloom's[12] series of cases treated with vitamin A discloses no carcinomas. If vulvectomy can be carried out so that it does not mutilate or impair function, it would appear that this radical procedure would in this respect be regarded as the most conservative.

SUMMARY

The etiology of pruritis vulvae is discussed in terms of its somatic, systemic, psychological, and local causes.

Leukoplakia and kraurosis vulvae (senile vaginitis) are considered in the light of their different pathological and histological appearances, their different locations and their probable different etiologies.

The treatment of kraurosis vulvae is considered to be the relatively simple one of estrogen replacement in the form of local inunction.

The various therapy techniques for leukoplakia are outlined, including the use of bland ointments, vitamin A replacement therapy, radiotherapy, and surgery. Notwithstanding an appreciable percentage of recurrence of leukoplakia following surgical removal of the vulva, it appears that this radical procedure may actually be the most conservative form of therapy in the elimination of subsequent carcinoma. This is especially true if vulvectomy can be carried out as a non-mutilating procedure.

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*T.E.A.B. in Arthritic Pain**

Trevor H. Howell, M.R.C.P.ED.

Acute exacerbations of rheumatoid arthritis are frequently alleviated by tetraethylammonium bromide. As a preliminary trial, Trevor H. Howell, M.R.C.P.E., of St. John's Hospital, Battersea, England, injected 5 cc. intramuscularly in an elderly man with arthritic hands. Pain soon vanished and did not recur for three months. After treatment of the next attack, the patient remained free of pain and swelling for five months. T.E.A.B. was then given to 26 persons in courses of one to nine injections. Of those with active disease all but one gained some relief, and 19 improved.

In most cases remission begins within an hour, and relief may continue anywhere from five days to seven months.

The drug blocks impulses of the sympathetic system, by which the joints and ligaments are innervated. Periarticular lesions in soft tissue are not relieved by treatment, and massive fibrositis may be aggravated. Osteoarthritis and inactive rheumatoid arthritis apparently do not respond.

*Relief of pain in rheumatoid arthritis with tetraethylammonium bromide Lancet: 204, Feb. 4, 1950.

Group Psychotherapy with Senile Psychotic Patients*

A. Silver, M.D.†

Older patients are being admitted to mental hospitals in increasing numbers and last year 27 per cent of all patients admitted to Verdun Protestant Hospital were 65 years of age and over. Thirty years ago only 7 per cent of patients admitted came within this older age bracket. This trend shows no signs of declining and is everywhere causing concern.

As yet, these patients have received little in the way of an active treatment program other than the vitamin supplements to diet, symptomatic therapy and measures directed at the correction of physical defects. It was during an attempt to work out an integrated active treatment program that the idea of undertaking group therapy with senile psychotics was conceived and what follows is a preliminary report of our method and findings.

On surveying the literature, one finds no report of group therapy having been attempted with senile psychotic patients. Some would question the possibility of applying group therapy technics to this type of patient. However, until the scope of so-called "group" therapy is more clearly defined, we feel justified in applying this term to any type of psychotherapy that is evident and possible of application only in a selected group of patients treated as such. In order to explore the possibilities, 17 female patients between the ages of 70 and 80 years were selected for treatment. The length of time they had spent in hospital varied from 1 to 13 years.

Since the middle of February, 1949, the group has met twice weekly after lunch. Of this group of 17, five were classified as senile psychosis, paranoid; three as senile psychosis, confused; two as senile psychosis, presbyophrenic; two as senile psychosis, simple; one as senile psychosis, depressed; three as psychosis with cerebral arteriosclerosis; and one as psychosis with hypertension.

It was found that having the group close together in a small room made for cohesion. In this setting the members paid more attention to each other, there were fewer private conversations, and such that did develop were more readily controlled.

Group therapy was conducted with and without the serving of refreshments, although it was evident that better rapport, interest and participation were obtained when tea was served. The atmosphere of sociability and enter-

*Presented before the Montreal-Medico-Chirurgical Society, section on psychiatry, April, 1949.

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tainment was familiar and acceptable to these older people who tend to be at a loss in understanding a simple discussion group. The old ladies seemed to enjoy having tea with the doctor and were quite formal about it. It is quite surprising to what extent the social graces were maintained in these old ladies, many of whom are confused, deluded and hallucinated.

The keenness and interest of the therapist and the group produced by the stimulus of meeting together was found to lag after about 20 minutes, so tea was served at this time. Interest then revived and was carried along for the remainder of the hour.

The group was convened by the ward nurse and told that they were going to meet with the doctor. After entering the room and sitting in his assigned chair, the doctor explained that the purpose of these meetings was to give the members of the group a chance to discuss their problems with him. Because most of the patients exhibited poor memory, it was found necessary to repeat this statement several times throughout the session. It was found that an approach which indicated to the patients that there would be a concrete gain from talking produced the most response from a higher aged group.

A young patient whose mental condition was such that she was capable of taking accurate minutes, took extensive notes of group therapy meetings conducted with both recently admitted young psychotics and with the old people.

A survey of her notes revealed that among the younger patients a wide variety of topics were discussed with active interest. With the old people, however, the desire to go home came up again and again in every meeting, as revealed in our minutes. Most of the patients, when asked, said that their problem was that they wanted to go home. Miss H. said she wanted, 'to go right away home'."

"If you had your choice, where would you prefer to be: in hospital, in a nursing home, in a home of your own, or with your own people?" was a question posed to the patients at one meeting. The unanimous preference was for living with their own people rather than living with people of their own age in a nursing home even though they would have freedom to come and go as they pleased. They all admitted certain advantages to a nursing home and all thought they were very good and necessary for somebody else.

To check further as to whether all senile patients wanted to go home, several private patients residing in detached apartments with every comfort and convenience were interviewed casually and asked how they liked the hospital. The immediate reply was: "The hospital is a very fine place but I would like to be home."

This pattern was repeated again and again. It was only by persistent exercise of an interviewing technique that the discussion was guided towards other topics. When this was done, it was seen that other thoughts also occupied the older patients' minds, such as:

1. *Physical complaints.* Discussion of a patient's physical complaints which might include arthritis, various pains and aches, weakness, headaches, spells, sleeplessness, always produced a flow of conversation from the patient concerned, and lively comments and suggestions from the other group members. Snake oil and bear oil, for instance, were highly recommended for arthritis.

2. *The good old days.* Alarm at what the world is coming to—"What's the matter with the world today?" One patient was doing some embroidery which she showed to the others, which led to a rather animated discussion with patients explaining to the doctor the now vanishing custom of the hope chest. The patients also traced the evolution of custom of what the girl brings into a marriage of worldly goods from "the dowry," "hope chest" and "showers." Naturally, they all seemed to think that the hope chest was a much nicer custom than the present one of showers. One patient remarked humorously that the best thing a girl could bring into marriage was a wealthy father.

3. *Socio-economic factors.* The patients all revealed a distressing awareness of the socio-economic factors which caused them to feel a great insecurity. They mentioned the high cost of living and the associated difficulties of making ends meet on their pensions—"If one has to live on pension, it's hard to pay rent." They brought up the housing shortage and landlords and landladies who would not put up with the eccentricities of the senile individual when rooms could be rented readily to persons who were no trouble at all. Such eccentricities included occasional confusion, noisiness, and lack of care for self and room. The patients complained that their landlords, rather than catering to them or jollying them along, brought their failings to the attention of the doctor, social agency or police, who arranged for their admission to hospital.

4. *Loneliness.* With many of the patients, all known relatives and most of their friends are dead and they are acutely aware of being alone and helpless.

5. *Wishful fantasies.* In many of the patients diagnosed as senile psychosis, paranoid type, the paranoid delusions were wishful fantasies of a grandiose nature. One patient talked continually of pending real estate deals involving the prime minister, the federal government and the United States. Another patient, poor as a church mouse, talked of great wealth, a part of which was to be bestowed upon the therapist for aiding in the patient's immediate release.

A gentle attempt to jolly these patients about their delusions revealed that the delusions are firmly held and evidently fill a basic need of their aging psyches. These delusions have not as yet been affected by group therapy.

6. *Rejection.* None of these patients would recognize a fact quite obvious to the nursing and medical staff, that in some cases their own families were not prepared to accept very much responsibility for their care. This feeling of rejection is one of the first things a young psychotic patient will sense even where it is non-existent or intangible. This same feeling is not grasped by older patients who are capable of making other observations that require a greater degree of astuteness. This would seem to be a fortunate and natural circumstance.

Certain adjuncts to treatment were also used:

A variety of music was played on a guitar and sung by an intern and the group encouraged to join in. Folk songs and old songs known to patients were best received. Music was a source of pleasure and increased group cohesion. We found that it was best used occasionally and in small amounts as these patients have a short span of attention.

The group was put on nicotinic acid (100 mg. t.i.d.) to produce cerebrovascular dilatation in an effort to improve memory, lessen confusion and improve sleep. Some were concerned by the flushing but responded to reassurance.

An occupational therapist worked with the patients in the same setting on days when they did not receive group psychotherapy.

Some psychological tests to gauge progress are being adapted to these cases. Home visit resources are being extended and utilized more.

RESULTS AND CONCLUSIONS

The short span of attention, the amnesia and the persistence of ideas were specific problems encountered in this group of organic patients. They call for activity and ingenuity on the part of the therapist.

Symptoms dependent upon conditions such as arthritis, cardiac failure, hypertension, anemia, and diabetes, were discovered during the closer observation afforded by group psychotherapy and received appropriate treatment.

We have found that group therapy with senile psychotic patients improves ward morale particularly for nurses who see an active treatment program attempted on the old patients who require so much nursing care. Furthermore, nurses in charge of these patients report improved behavior, cleanliness and eating habits, and less confusion.

Patients turn up at meetings in their Sunday best—partly on their own initiative, partly that of nurses. If they dirty these clothes, more seem to be available. The effect of being clean, neat, and orderly for at least two hours has definite carry-over value.

Relatives now come and see the doctor to discuss visit possibilities and ways of doing something more for the patient. This situation does much to relieve the distress a family feels when an older member, and particularly a parent, must remain in hospital because of mental disorder.

SUMMARY

The relative proportion of senile patients in the hospital population is on the increase, yet little report could be found in the literature of an integrated, active treatment program for them.

Group psychotherapy, modified and including therapeutic adjuncts, was undertaken with 17 female patients hospitalized for psychoses of the senium. As a result of the experiment, improvement was noted in the patients' morale, cleanliness, and general behavior. An increased co-operation on the part of relatives was also noted.

Hormonal Therapy in the Aging*

Thomas Hodge McGavack, M.D.†

NO COMPLETELY satisfactory concept of the aging process exists. The purely involutional changes occurring beyond the prime of life, which may be looked upon as aging in the strictest sense, are separated with difficulty from the degenerative conditions that appear as a result of man's unending battle with environment.

It has been generally conceded that the regulatory action of hormones cannot be exerted in the absence of potentially normally functioning target organs or tissues. In the aging process, we have been prone to accept changes in such organs and tissues as bona fide evidence that they are no longer responsive to hormonal stimulation, ignoring completely or in great part the fact that these glands of internal secretion also tend to wear out and may themselves be the cause of the waning activity.

IF THIS entire process of aging is "physiological" then it is easy to assume a laissez faire position and make no effort to ease the burden of those who are growing old. Because such an attitude has not been blindly accepted, man's life expectancy has risen from 47 to 63 years within a 40-year period. Every advance in medical knowledge of necessity alters our concepts and our approach so that that which today may be recognized as physiological old age may tomorrow be considered a pathological senescence.

A few illustrations may serve to amplify this statement.

Not so many years ago kraurosis vulvae was looked upon as a continuously progressive process, best left alone, but subject, only if too troublesome, to rather difficult and often unsuccessful surgical intervention. Today its damaging effects and secondary fibrotic changes usually give way promptly to gonadal therapy.

THE CORONARY sclerosis of myxedema, long believed to be based upon permanent unalterable changes in the tissues, is today recognized as reversible with full return of cardiac compensation when proper hormonal replacement and stimulation are achieved.

Until recently, loss of muscular tone and strength, as well as diminution in muscle mass, has been accepted as the inevitable accompaniment of years. Now such tissues have been proven capable of responding to corrective hormonal therapy, provided of course that blood and nerve supply have not been irreparably damaged. It seems therefore that we must analyze every factor concerned with the alterations that take place in advancing years

*Read before the sixth annual meeting of the American Geriatrics Society, June 4, 1949, Atlantic City, N. J.

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before we have a right to categorize that which is reversible and that which must be endured because it cannot be cured.

In discussing hormonal therapy in the aging individual, the impress upon him of heredity[1, 2, 3] and a myriad of nutritional and environmental factors[1-8] cannot be ignored. Collectively, these comprise a constellation of influences, each of which exerts its effect upon the organism as a whole and upon its individual components. Thus, it must be realized fully that the capacity of the organism and its individual tissues to respond to any given stimulus varies considerably with age. The reactions at any given period of life will differ not only in degree but also in kind from those to be observed in any other portion of the life span. It is the interplay of all these variables that conditions the specific effects to be observed in any given subject or group of subjects. So closely integrated is the entire organism that it is impossible to alter any one of these factors without to some extent impinging upon another or many others. Seeking the cause, and therefore perhaps the cure, for any one condition may prove futile; rather should there be recognized a constellation of changes which predetermines a series of effects. The net effects of some single stimulus will of necessity depend upon the varying status of all the other interrelated conditions and functions. Any pattern for discussing aging and our use of hormones in suppressing its eventual ill effects upon the organism as a whole can, in the present state of our knowledge, be subjected to criticism. Nevertheless, it is clear that progress in the solution of the many problems must envisage a study of each factor singly, later revising our concepts to conform to the pattern of the whole.

In our consideration of hormones applied to aging persons, it is essential to separate those disturbances which are due to nutritional factors[4, 5, 6, 7, 9] resulting from an insufficient intake of food, and failure in digestion, absorption and assimilation, as also the damage to the organism which results from disease. Here again it is not always easy to draw sharply defined lines nor to correct even in major part such complicating features prior to the application of hormonal therapy. For instance, we have seen bedridden, lethargic, incontinent patients with nutritional deficiencies secondary to anorexia change under the influence of hormonal therapy in such fashion that the nutritional imbalances have been voluntarily corrected through the improved mental and physical stimulation afforded by the hormone alone. One is treading on dangerous ground to say that in such instances the hormonal deficiency is primary and all other phenomena secondary; and the going is equally rough if it is postulated that the nutritional deficiencies induced the glandular alterations; yet these seemingly advanced senescent changes have been favorably influenced by attacking the cycle of events at a specific point. From the standpoint of practice this seems more important than the academically interesting questions as to which factors are primary and which secondary. Integration of each part of the whole system seems so delicately balanced that by altering one factor at a time, we may thus slowly but surely aid in restor-

ing the integrity of the organism which still remains capable of responding to biological stimuli.

That all of the glands of internal secretion are altered in appearance and function as aging proceeds appears now to be well proven[1, 8, 10, 11, 12]. In an effort to prevent or retard the changes which accompany aging, some point of departure seems necessary. This is most readily afforded by recognition of the alterations which occur in the lives of both men and women as sexual activity wanes in middle or late middle life. A chain of endocrinologic variations may be seen to stem logically from the diminishing activity of the gonad at this time. It is common knowledge that the judicious use of gonadal therapy, while not materially influencing libido, potentia or reproductivity, may prevent metabolic changes which begin to handicap the activity of the organism from that period onward.

Among the more specific diagnostic tools for ascertaining the role played by each of the glands concerned in these changes of the climacterium are the basal metabolic rate; the serum cholesterol; the serum precipitable iodine; the excretion of gonadotrophins, 17-ketosteroids, and 11-oxycorticoids; the adrenal reaction to administered adrenotrophin and epinephrine; responses to administered glucose with and without concomitant doses of insulin. Of clinical value are static and dynamic work tests, timed tests for alertness and reaction time ("celerity" tests), fusion frequency of flicker, and so forth. Loss of capacity for static and dynamic work may indicate a loss of gonadal or adrenal function or an overactivity of the thyroid. In a limited number of observations, an increased reaction time or a diminished response to the "celerity" test has been observed frequently in conjunction with adrenal and

TABLE I

SOME METABOLIC EFFECTS OF HORMONES

Hormone	Source	Influence* upon				
		Electrolyte retention	H_2O retention	Gluconeogenesis and CHO storage	CHO mobilization and utilization	Nitrogen balance and anabolism
Folliculoids	Ovary Adrenal	+	+ +	?	?	± to +
Testoids	Testis Adrenal	+ +	+ +	—	?	+ + +
Thyroid	Thyroid	—	— —	O (?)	+ + + +	— —
Mineralocorticoids	Adrenals	+ + + +	+ + + +	O	O	O
Glucocorticoids	Adrenals	— — — —	— — — —	+ + + +	+ + + +	— — —

*Influence upon the activity is graded in degree from + to + + + + when a positive action is indicated; — to — — — — when the function mentioned is opposed; and O when no known influence exists.

thyroid deficiency, although it cannot be denied that we have also seen it when gonadal therapy completely restored the altered state to normal.

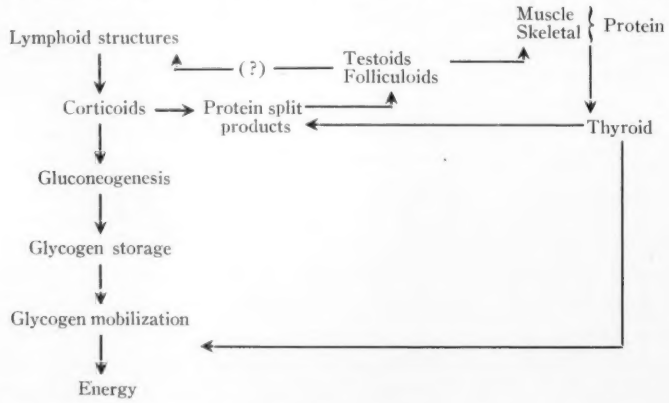
What are the more important metabolic features of the hormonal adjustments of this climacteric period? Normally the thyroid, gonads, and adrenals play a vital part in certain aspects of intermediary metabolism (Table I).

The retention of electrolyte and water is furthered by folliculoids, testoids and mineralocorticoids. Probably part, if not all, of the tissue desiccation described as an accompaniment of aging[8, 10] results first from a loss of folliculoids and testoids produced in the ovary and testis and later is accentuated by a failure of the adrenal to produce these same hormones. The excretion of electrolyte and water is augmented by thyroid hormone and the glucocorticoids of the adrenal. It is the balance between these two groups of opposing autocoids which plays a major role in the state of hydration of the tissues and in the availability to them of necessary electrolytes, particularly sodium, potassium, chloride, phosphate and calcium. As a rule, at the climacterium, the loss of the relatively weak action of testoids and folliculoids is readily compensated by the mineralocorticoid activity of the adrenal, although the histological changes in the zona glomerulosa, which is presumed to be the seat of mineralocorticoid formation are far from dramatic, and may indeed not be demonstrable with routine histological technics.

The greater and more important adjustments of the climacterium concern the building up and the tearing down of tissue, and the movement and utilization of materials necessary to meet the energy requirements of the body. In this regard the testoids, and possibly the folliculoids, play a unique role—one which must be taken over by the adrenal as age advances. The testoids have been shown to further the storage of nitrogen in the muscular

TABLE II

INTERACTION OF ENDOCRINE GLANDS IN CONTROLLING ENDOGENEOUS PROTEIN METABOLISM*



*Arrows denote the direction of the reaction.

structures of the body, as indeed in the protein matrix of the skeleton (Tables I and II). In order to do this protein building blocks must be furnished; apparently the testoids cannot prepare such protein moieties. Therefore, preliminary to anabolistic processes controlled by testoids, the glucocorticoids of the adrenal cortex are necessary to prepare and regulate the flow of protein split products to the muscular and skeletal tissues. These glucocorticoids are capable of mobilizing tissue protein from the lymphoid structures of the body thus making it available not only for the building of new tissue elsewhere but also for gluconeogenesis. In the presence of testoids the protein moieties brought into the metabolic pool by the glucocorticoids are anabolized to form muscular and skeletal protein. The catabolism of such protein may later be initiated by circulating thyroid hormone, which has a specific influence in making such protein available for energy[13].

THUS we see that the nitrogen balance of the body, and the constant turnover of protein which is necessary for normal satisfactory muscular performance is, at least in part, a hormonally regulated activity not delegated to a single gland or autocoid, but requiring the balanced action of the gonad, the thyroid and the adrenal (Table II). It therefore indirectly calls for an important adaptation of pituitary function as one phase of life gives way to another. When folliculoids and testoids arising from the gonad decrease during the climacterium, there is an increase in the activity of the basophilic cells of the pituitary. This is reflected early and for a variable period of time in an increased production of gonadotrophic hormone. In a much more sustained fashion, there is an increased outpouring of adrenotrophin which results in hypertrophy of the adrenal cortex with histologically demonstrable changes particularly evident in its zona fasiculata[1]. This is in keeping with Deane and Greep's conception that this zone is particularly concerned with the elaboration of glucocorticoids[14].

Concomitant with these changes, there is early an increase in the activity of the thyroid gland, usually followed later by considerable alteration in its histological appearance[8], which may or may not give rise to functional changes suggestive of hypothyroidism.

It appears that the loss of the production of steroids by the gonad at this time of life is partially compensated by an increased activity of the adrenal cortex. If this reaction is maintained within physiological limits, there results an asymptomatic readjustment of the body economy, in which reproductive activity is lost, but the important metabolic effects of the gonadal steroids are retained.

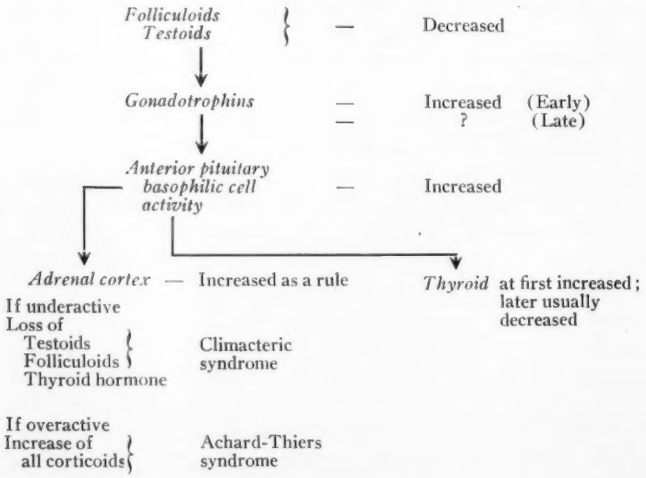
In the process of this adjustment, the interdependence of the adrenal cortex and the thyroid gland becomes more rather than less significant, for the gonadal influence on the latter structure is more or less completely lost at this time. The relationship between the thyroid and the adrenal is mediated partly if not wholly through the pituitary. The levels of activity of the adrenal cortex and the thyroid vary more or less directly with each other.

As long as a physiological balance is maintained between them, patent thyroid disturbances of a clinical nature do not occur. In some instances, however, either hyperthyroidism or hypothyroidism, the former more commonly, may appear at or shortly after the onset of the climacterium.

It is obvious that many functional variants can develop as a result of the initial change in gonadal function occurring at the menopause or in the climacteric period. Attention will be focused only on what may happen if the adrenal fails to respond completely or if it reacts by hyperfunctioning (Table III). In the former instance, testoids and folliculoids are not formed in sufficient quantities to carry out their anabolic functions. From our clinical studies to date, this failure appears to be fundamentally concerned with the manifestations of an abnormal climacterium. The fault may lie in a failure of the pituitary basophilic cells, thus affording insufficient stimulation to the adrenal cortex, or in a failure of the adrenal cortex to respond to the increased adrenotrophic activity of a normally behaving anterior pituitary. In the former instance, the thyroid function will usually be curtailed, and at times a diagnosis of hypothyroidism is made (Table III). However, thyroid hormone aggravates rather than improves the condition. In the latter instance, hyperthyroidism may occur, and the aging process be accelerated due to the failure of the adrenal to produce its anabolistic hormones. In the first instance treatment with testoids and folliculoids, separately or in combination, as well as thyroid hormone is indicated. In the latter instance, a satisfactory result is usually attained by the testoid-folliculoid therapy only.

TABLE III

CLIMACTERIC ALTERATIONS OF ENDOCRINE FUNCTION*



*Arrows denote the direction of the reaction.

If the adrenal overresponds at the time of the climacterium, the resulting condition is best described under the term Achard-Thiers syndrome (Table III) or some modification thereof, in which a hypercorticoid state can be recognized clinically. The hypertension, the hirsutism and the diabetes are suggestive of an increase in mineralocorticoids, testoids, and glucocorticoids respectively, while the obesity possibly indicates a hypothalamic or hypothalamico-pituitary disturbance. As a rule, thyroid function will be increased but rarely calls for treatment specifically directed towards it. Therapy for the overreactivity of the adrenal as represented in the above or a kindred syndrome has not been very satisfactory to date. Often the patient's condition can be improved by the use of estrogens in large doses with the hope of partially suppressing the activity of the basophilic cells of the anterior pituitary. Not infrequently, however, the retention of fluid is increased and the obesity aggravated by such therapy—possibly due the simultaneous suppression of glucocorticoid activity, or interference with neurohormonal pathways, or both. Large doses of testoids are perhaps the best therapy under such conditions but care must be taken not to aggravate the hirsutism.

CONCLUSIONS AND SUMMARY

1. Aging may be likened to a somewhat ill defined, complicated picture which depicts changes in the organism that result from its slowly losing battle with environment. The pattern is one of a complex mosaic in which the disturbances of endocrine function are found to be an illuminating, if not always fundamental, part of the tesselated structure. The facets or pieces are variegated and innumerable, each when properly placed adding color and meaning to the others.

2. As a point of departure for viewing the participation of the endocrine glands in this aging process, certain alterations taking place in the endocrine system at the time of the climacterium have been discussed.

3. The loss of testoid and folliculoid functions occurring in connection with the change of life cause changes in the anterior pituitary which result in a shifting of certain metabolic burdens from the gonads to the adrenal glands.

4. Failure in the proper adjustment of this and other glands may result in one of a number of clinical syndromes, some of which are amenable to replacement, suppressive or stimulatory hormonal therapy.

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Cytochrome C in Treatment of Senile Conditions

Richard W. Garnett, M.D., *and Walter Klingman*, M.D.

The enzyme cytochrome C fills many cellular needs, especially during tissue anoxia or nerve regeneration. At the University of Virginia in Charlottesville, Richard W. Garnett, M.D., and Walter O. Klingman, M.D., found that the mental condition in various stages of senility and arteriosclerosis was improved after use of this enzyme. Trial dosage in 17 cases consisted of one cc. injected intravenously the first day, two cc. the second, three cc. the third, then five cc. daily for a total period of two weeks.

Benefit was noted during treatment in 11 cases and for longer intervals ranging up to several months in seven. The gain was prolonged in one instance by weekly or biweekly administration. Improvement is most likely to continue in the typical early phase of deterioration, with memory defects, disorientation, confusion, and irritability. No significant changes are observed in psychometric scores, but alertness, cooperation, and ability to verbalize increase, confusion decreases, and behavior is more relaxed. Treatment is also helpful for acute toxic inflammatory reactions of the nervous system.

The group with only transient benefit are chiefly neurotic or psychotic and probably influenced by suggestion. Cytochrome C apparently does not affect severe organic lesions such as cerebral accident.

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Treatment of Indolent Ulcers of the Skin

Louis Feldman, M. D.*

THE HEALING of chronic body ulcers presents a constant challenge to medicine for despite all known classical procedures for their treatment, there are still numerous failures. In this particular study a special physical therapy measure, phototherapy, has been evaluated. We are not dealing with specific wave lengths in this treatment, but with the entire range of electromagnetic spectrum from the infra-red through the visible spectrum to some part of the ultra-violet region.

The *infra-red* group is characterized by long wave lengths—for treatment purposes ordinarily employed, from 64,000 to 6500 Angstrom Units (A.U.) in the spectral range. The reaction time is short; local hyperemia and sweating occur almost immediately due to the dilatation of the skin blood supply. This suggests surface absorption and may be an indication of its slight penetrability.

The shorter wave lengths of the *luminous rays* extend from 6500 A.U. in the red to 4100 in the violet. Photochemical in nature, they penetrate to the deeper layers of the skin causing a rise in temperature, and probably an increase in circulation and lymphatic drainage. The reaction time is also short. They are not directly bacteriocidal and produce no sunburn, yet they do have a certain irritant effect on the skin. By means of thermocouples placed under the skin, it was shown that the temperature was raised 12 degrees higher with the luminous rays plus the associated infra-red than with the infra-red alone. Indirect germ destruction probably takes place due to increased circulation, leucocytosis, and phagocytosis.

In the *ultra-violet* group the wave lengths are shorter still, ranging from 4100 to 1850 A.U., though the lower limit for most treatment is 2000 A.U. These penetrate very superficially, so that if a deep destructive effect is desired, as in lupus vulgaris, it is necessary to use the local water-cooled ultra-violet with enough pressure to dehematize the skin. Their reaction time is prolonged a minimum of three hours; the shorter the wave length the more delayed the reaction period, and the greater the absorption. The wave lengths below 2900 A.U. are strongly bacteriocidal.

Where there is a deficiency of the blood calcium and phosphorus, exposure to ultra-violet will result in a prompt increase of these constituents even above normal. Irradiation of cholesterol present in the skin causes the

*Reported at staff conference of Jewish Memorial Hospital, February 7, 1949.

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formation of vitamins A and D, the former aiding in growth production, and the latter affecting the calcium and phosphorus metabolism of the body. the body.

SELECTION OF CASE MATERIAL

ONE HUNDRED patients were selected from a large and varied group, and further divided into four groups of 25 persons each. The first group received infra-red radiation only; the second, luminous heat; the third, ultra-violet; and the fourth, a combination of luminous heat and ultra-violet. These patients were treated consecutively as they were referred to the clinic. Only those patients were chosen for study who had the condition over a long period of time (from six months to six years) and had tried all other methods of therapy with no favorable results. Our cases consisted of ulcers of the skin in various parts of the body, chiefly the extremities.

Our patients were inmates, variously, of a home for the aged, a veterans' facility, an incurable hospital, a mental institution, and a large general hospital. There were various age, mental, emotional, sociological, and economic factors present, all of which had a great bearing on the outcome. The continuation of the ailment for from six months to several years, plus the fact that they had had a series of unsuccessful treatments, had made their outlook very pessimistic. We hoped that with this new form of therapy we might be able to reduce their pain and disability, and at the same time remove some of the burden from the overtaxed personnel and nursing staff.

DEFINITION AND CLASSIFICATION OF ULCERS

ACCORDING to DeCosta, an ulcer is a loss of substance due to molecular death of superficial structures. It may vary as to cause, size, location, depth, or degree, and in most instances if not infected at first, does become so later. Necrosis of a superficial part may arise from inflammation; the action of pus-producing bacteria; traumatism, injury, or irritants; prolonged pressure; deficient blood supply; faulty venous return; degeneration of neoplastic infiltration; and trophic and nutritional disturbances with vitamin or protein deficiencies.

Ulcers may be classified into two groups according to the condition and associated constitutional state. In group one are listed varicose, hemorrhagic, acute, chronic, irritable and neurologic. In the second group may be placed tubercular, syphilitic, senile and scorbutic. All ulcers, whatever their origin, are either acute or chronic and may cause severe pain, hemorrhage, edema, exuberant granulation, phagedena, sloughing, eczema, and scurvy.

Our group of 100 patients presented the following varieties: 10, infectious; five, eczematous; 25, varicose; two, diabetic; two, tubercular; three, syphilitic; 10, trophic; 13, nutritional; 10, peripheral vascular; and 20, decubitus. The legs are the commonest location, but ulcers are also found on the buttocks, the lower end of the spine, elbows, heels, fingers, toes, upper arms, face, and neck.

TREATMENT

THE CLASSICAL forms of treatment previously undertaken in our group were rest, elevation, compression, curettement, excision, high venous ligations, sympathectomy, various local applications with and without compression, bandages, elastic stockings, early ambulation, and exercises. Among the physical therapy procedures that had been tried were static pencil spray, high frequency effleuve, histamine, and mecholyl iontophoresis.

Since our departments are essentially referral divisions, patients sent to us have had careful workups, studies, and tests. Diagnoses were made by the referring physicians of the various clinics. All dressings were to be done in our department to avoid any possibility of further trauma or introduction of mixed infection or contamination into the area. Before each treatment, dressings were removed in our clinic. The ulcer area was cleansed thoroughly to the base with sterile pledgets of glycerite of peroxide 10 per cent. The part was then exposed to either of the following radiations according to our grouping: group 1, infra-red, 500 watts, 30-inch distance for 20 minutes; and group 2, ultra-violet (air-cooled lamp), 30-inch distance, erythema dose. The dose of ultra-violet was gradually increased by one minute until the treatment time was 20 minutes or until the ulcer was healed. In group 3, luminous heat was given for 30 minutes at 30-inch distance, followed by ultra-violet (air-cooled) in dosages previously described. In group 4, luminous heat alone was given. After treatment, a sterile gauze dressing with a little sterile vaseline to prevent sticking was applied to the area with orders that it was not to be removed except by one of us in our department just before the next treatment.

The treatments were given daily for the first two weeks, and then on alternate days until the suggested course of treatment was completed or healing had taken place. About six to 12 post-healing treatments were given to improve circulatory, nutritional, and bacteriological conditions and the skin was tanned and toughened to prevent recurrences.

RESULTS

THE *infectious* ulcers became clean after very few treatments. The discharge changed from thick, foul mucopurulent to mucoid, and then to watery serous. The bases were clean, and healed from the bottom up with healthy granulations, followed by epithelization and new skin formation. The surrounding skin showed evidence of good color and texture, and improved circulation. Treatment in this group was given for four weeks; daily for the first two weeks, then every other day for two weeks more. There was no recurrence at the end of a three-month period without treatment.

The *eczematous* ulcers became clean and healed. The surrounding skin was smooth, non-pruritic and healthy in appearance. Except for pigmentation in and about the ulcer area with a soft scar, the rest of the skin appeared normal. Treatments were given daily for two weeks, then on alternate days

for six more weeks. At the end of six months no apparent recurrence had taken place.

Varicose ulcers healed with considerable irregularity, scarring and thickening of edges. There was considerable improvement in the condition of the surrounding skin, also improved collateral circulation. Treatments were given daily for two weeks, then on alternate days for the last six weeks. After eight months there has been no evidence of recurrence.

There were only two patients with *diabetic* ulcers. Despite careful supervision as to diet and insulin requirements these patients did not heal until they began our treatment. Daily treatments were given for two weeks, then on alternate days for ten more weeks. There was no recurrence at the end of nine months in spite of frequent breaks in their diets and in their insulin requirements.

We had two patients with *tubercular* ulcers and both had pulmonary involvement. One ulcer was located on the face and one on an arm. We succeeded in healing these ulcers in about 14 weeks despite the fact that there were repeated recurrences and breakdowns during this period, always associated with a flareup of their lung symptoms. The treatments were given daily for two weeks, then on alternate days for the next thirteen weeks, still with no recurrence. Finally, they remained healed at the end of a three-month period of observation without treatment.

The patients with *luetic* ulcers had tertiary syphilis and the ulcers were really degenerated gummas. They had and were receiving associated antiluetic treatment. Despite the use of mapharsen, bismuth, and penicillin, they remained not only sero-positive but the spinal fluid was positive also. We succeeded in repeated instances in apparently healing them, but, after a few days to one week, they broke down again. After twenty-four weeks of treatment and four months' observation, treatment was discontinued, as it proved of no value in this particular group.

In several of the patients with *trophic* ulcers there was definite nerve involvement as in a fractured lumbar spine, and in hemiplegia. The treatment period was eight weeks. Definite improvement in the circulation was apparent in marked decrease in the swelling, reduction of temperature, and better color of the ulcer site and the surrounding tissue. This trophic group was definitely infected and the light radiations, especially ultra-violet, had a definite stimulating, bacteriocidal and bacteriostatic effect on the tissues. There was no recurrence at the end of 12 months with no treatment.

Many of these patients with *nutritional* ulcers were anemic and cachectic and suffered from associated vitamin deficiencies. They had been receiving high protein and high vitamin diets, together with amino acids given parenterally but they showed little or no response. In our department they were treated in a routine manner, as outlined, for 12 weeks, and at the end of one year did not show any signs or symptoms of recurrence.

The group with *peripheral vascular* ulcers was much older as far as numerical age was concerned, some of them suffering with thrombophlebitis,

endarteritis obliterans, or Buerger's Disease. Two were amputees that developed ulcers on their stumps. In the group there was one with Raynaud's disease and several with other circulatory vasospastic conditions. Some of them had had sympathectomy and/or high venous ligations, with some relief for a short period of time. Among the treatments previously administered were various exercises, diathermy, vacuum suction boot, hydrotherapy, and still recurrences took place. In our department they were given treatments for 13 weeks and after 12 months of observation with no treatment, there had been no recurrence although their constitutional conditions had remained stationary.

Our patients with *decubitus* ulcers, or "bed sores," had received the best care that anybody could expect in our institutions, yet these conditions had developed. In our series, after eight weeks of treatment, recovery took place. After the ulcers had healed, it was suggested that ultra-violet radiation, both local and general, be continued as a tonic effect for improving nutrition and circulation, and to stimulate the calcium phosphorus and vitamin A and D metabolism.

SUMMARY

A group of 100 patients with skin ulcers, who were in a poor mental physical, social, and economic state, were selected for phototherapy treatment. All forms of heliotherapy alone or in sequence were useful adjuncts in the treatment of their chronic ulcers. Luminous heat plus ultra-violet was the best combination of treatment, and was effective in a much shorter time. In the luetic group all forms of treatment failed. Only when many others have attempted to carry through similar procedures, and have been able to duplicate our findings, then and only then can we say that something new has been added to the armamentarium in the therapy of chronic indolent ulcers.

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GERIATRICS

Official Journal of the
American Geriatrics Society

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Rehabilitation in Geriatrics

TODAY, medicine is once more standing on the threshold of a new concept which has, paradoxically, been forced upon us by our own success in reducing the incidence of death from infection and communicable diseases, producing the phenomena of an aging population.

What are the medical and public health implications of this increasing age level of the population? First, as people become older, their medical needs change, and they demand more medical service. In 1940, the 26.5 per cent of the nation's population over 45 required over half of the nation's medical care. By 1980, it is expected that the number of persons over 45 will constitute nearly half of the population. We are now busily studying and discussing the needs and best method for increasing and distributing medical services, yet the growing age level of the population indicates that by 1980, we may need nearly double the amount of medical service available today.

Secondly, lacking specific measures to cure many of the chronic diseases, medicine must look to rehabilitation to teach those chronically disabled to live and to work as effectively as possible with what they have left. Until medicine finds specific answers to the problems of the diseases of the heart and circulation, rheumatic fever and arthritis, multiple sclerosis, Parkinson's disease and the other crippling conditions frequently associated with the aging process, we must utilize the techniques of physical medicine, rehabilitation, psychology, social service and the other allied ancillary specialties of rehabilitation to teach the disabled to live not within the limits of their disabilities but to the hilt of their capabilities. Until we find the etiology and treatment for the chronic diseases producing disability, we can expect, as the population

ages, that the extent of physical disability in this nation will progressively increase.

One of our great medical needs today is for the provision of total treatment of chronically ill and aged persons in terms of the every-day problems of living which they face. Many such patients cannot be rehabilitated to the extent of employability, but a great percentage can be rehabilitated to the point of sufficient self-care so that they can live independent, dignified and happy lives at home, requiring a minimum of aid from other members of the family.

Both the Veterans Administration and some civilian hospitals have demonstrated that rehabilitation to the point of self-care and even to full or limited employment is possible for many of the chronically ill who have been hospitalized for long periods. Yet in most of our civilian hospitals, the patient receives few services of this type. Hospitals complain that the chronically ill and aged are responsible for their overcrowding, but they do little to provide the retraining services that will permit many patients to leave the hospital.

The hospital of today is being recognized more and more as the focal point in community health activities. With the changing demands being placed upon it, because of the growing incidence of chronic disease and disability, it must also play a more important role in the rehabilitation of patients. Hospitals in the past have concentrated almost solely upon the definitive aspects of medicine and surgery. If the hospital is to meet the changing health needs created by an aging population, it must assume greater responsibility for all three phases of medicine—prevention, definitive treatment, and rehabilitation, for the problems of chronic disease can be met only by the creation and utilization of abilities rather than the mere building of facilities.

HOWARD A. RUSK, M.D.

Chronic Disease

A. L. Chapman, M.D.*

The four pillars upon which a chronic disease control program can be built are prevention, early diagnosis, adequate and continued treatment and rehabilitation.

Multiple screening tests are the indicated approach to early diagnosis of chronic disease, and improved medical facilities are needed for proper care, including more nursing homes, expanded out-patient services, housekeeping and home care services, and medical social services. Provision of rehabilitation centers and services cannot be omitted from any long range plan of community organization for the care of the chronically ill.

An educational campaign is necessary to rid employers of the unfounded fear that older workers will increase production costs and to change the traditional policy that retires workers at any arbitrary age limit regardless of capacity to work.

*The Military Surgeon, 106:106-110. 1950.

Sociomedical Progress

Devoted to constructive correlation of interrelationships between sociological and medical problems in the aged. . . .

Personal Adjustment of Old People In Church Homes for the Aged*

Ju-Shu Pan†

THE INFLUENCE of institutionalization on the problem of adjustment in old age has been studied from the standpoint of two questions: (1) The factors affecting adjustment of individuals in institutions as compared with persons in the general population, and (2) the relation between their activities and attitude scores and those factors making for successful or unsuccessful adjustment.

A study was made of 730 old people selected from homes for the aged sponsored by Protestant religious groups in the northern part of the United States. Since the group is not a random sample, it cannot be considered to represent the average institutional population. The findings have been compared with those of a similar study made by Ruth S. Cavan of 499 males and 759 females, most of whom lived in their own homes.

A knowledge of the various characteristics of the two groups under different conditions, such as age, sex distribution, education and marital status, was believed to be relevant to the problem of sampling since it would indicate the degree of adjustment in addition to testing for the probability that the percentage difference within items was due to chance. Some items were omitted because of no significant differences. Due to the small number of cases of men (133) in this study, it was not feasible to compare them with Cavan's male cases. The comparisons, therefore, have almost always been limited to the women in the two groups. Interpretations, therefore, are confined to a consideration of the female in the two studies.

In order to determine general trends in the adjustment of institutionalized old people, their responses in various fields of adult activities, i.e., health, family friends, leisure, employment, security and religion, were examined. An hypothesis was formulated in each of several different fields of activities which seemed applicable to persons of later maturity. Reactions and activities of the group were studied both in relation to the findings of previous studies and as a means of confirming or disproving the proposed hypothesis.

		Present Study %	Cavan Study %
Composition of age	(female)	77.0	72.1
Sex distribution	(female)	81.8	60.4
Median years of schooling	(female)	11.8	10.9
Marital status:	(female)		
Never married		38.9	13.5
Married and living with spouse		7.2	32.2

*Written as part of Ph.D. dissertation, Department of Sociology, University of Chicago.

†Junior research fellow, National Institute of Health.

Health Status

Hypothesis: Institutionalization of old people reduces neurotic symptoms, serious illness, special health care, and physical difficulties.

Differences in health status between the institutionalized group of the present study of 597 female cases from Protestant church homes and non-institutionalized of Cavan Study of 759 female cases of old people living outside the institutions are indicated in the following items:

Items	Present Study %	Cavan Study %
Neurotic symptoms:		
None	37.3	28.5
One	28.9	21.3
Two	16.3	20.4
Degree of illness:		
Constant illness	18.0	26.1
Slight illness	31.6	43.4

Thus, the indication that subjects in the present study, although older, have fewer neurotic symptoms and less illness than Cavan's mixed group, tends to confirm the hypothesis that institutionalization of old people is conducive to good health and reduces the need for special health care by others.

Family and Home Conditions

Hypothesis: Institutionalized old people have a higher proportion of unmarried cases and, although those who have been married consider their married life above "average" in respect to happiness, both the married and unmarried cases are associated with unfavorable family relationships and therefore prefer to live in the institution. Differences in family and home conditions are indicated in the following items:

Items	Present Study %	Cavan Study %
Possess children and relatives:		
Without children and relatives	35.4	9.6
Without children but with relatives	28.0	17.6
With children but no relatives	9.5	17.2
With both children and relatives	27.1	55.6
Parent-child relationship:		
Poor or worse	12.1	20.9
Living arrangement:		
Choice	45.0	62.7
Both choice and necessity	48.3	28.1

The findings indicate that subjects in the present study show a less poor relationship to their children than was found in the Cavan study. Also, even though old people living outside the institution may have more favorable living arrangements, the greater percentage of cases in the institution are residing there by choice rather than by necessity, the proportion of "by necessity" in both studies being less than one out of ten.

Relation of Institutionalization to Retirement

Hypothesis: Length of residence in the institution is associated with the length of retirement from active service. The longer the period of retirement, the longer they have been living in the institution and the more aged they consider themselves.

In the present study, approximately 50 per cent of the cases had lived in the institution less than three years, and 56.7 per cent had retired within ten years. Their self-rating as to which age group they belong is as follows:

Items	Present Study %	Cavan Study %
Self rating of age group:		
Aged	21.0	7.3
Old	22.5	16.4
Middle-aged	9.8	30.1

In the present study, cases are four to five years older than those of Cavan's study. The table indicates that institutionalized old people are self-conscious of their age and probably consider themselves older than they really are. Because they are retired from active service and confined in an institution, they consider themselves put on the shelf or of no use. Thus, they are old not only chronologically but also psychologically.

Contrary to the hypothesis, one out of two cases in the present study has lived in the institution less than three years, although approximately the same proportion of cases have been retired from active service for a period of ten years. The discrepancy may be due to the fact that it is difficult for old

people to gain admission to an institution. Usually one-third as many are on the waiting list as are actually living in the institution. In many cases, furthermore, old persons are reluctant to ask for admission to an institution, preferring to remain in their own homes as long as they can take care of themselves. When once they are confined in an institution, they tend sooner or later to consider themselves too old to participate in any activity.

Contact with Friends

Hypothesis: Institutionalization of old people decreases the number of acquaintances and close friends, and lessens the opportunity of seeing friends and of having friends among children and young people.

Difference in contact with friends is indicated in the following items:

Items	Present Study %	Cavan Study %
Number of close friends:		
5-15	18.3	35.5
Number of acquaintances:		
Over fifty	69.8	77.0
Frequency of contact with friends:		
Seldom	33.3	21.7
Often	48.5	58.6

This indicates that Dr. Cavan's subjects had more acquaintances and a richer life than those in the present study. The data also show that Cavan's group had a higher proportion of close friends than those in the present study. The general tendency is that institutionalized old people see their friends less often now than ten years ago, because they are confined in the institution. They probably have physical or social difficulties which also tend to prevent them from visiting friends, i.e., no money to pay carfare, or embarrassment because of being institutionalized. In like manner, their former friends may be unable or no longer care to visit them, and gradually all contact is lost. The findings confirm the hypothesis that institutionalization of old people not only decreases the number of friends and acquaintances but lessens the opportunity of their seeing friends or making new contacts among children or young people.

Leisure and Recreation

Hypothesis: Institutionalized old people have more leisure-time activities, have more hobbies, and spend more time in reading and listening to the radio. Differences in leisure-time activities are indicated in the following items:

Items	Present Study %	Cavan Study %
Number of leisure-time activities:		
One to five	56.6	38.7
Six or more	42.0	61.3
Number of hobbies:		
None	30.0	37.7
Two or more	43.9	37.3
Time spent in listening to radio:		
Never	31.8	11.7
Few minutes	36.3	18.9
An hour or more	31.9	69.4

Although the data show that the control group had more leisure-time activities, this may be interpreted as meaning that old people in the institution may possess more leisure time but participate in fewer activities, because their activities are probably limited for the most part to those within the institution and they have little opportunity to participate in outside activities. On the other hand, the old people living in the institution surpass the control group in number of hobbies. The present study also shows that eight out of ten of the subjects spend one hour or more each day in reading. It should be kept in mind that the effect of institutionalization may be a strong factor in influencing the reading habits because old people, retired from active service and confined in the institution, have more free time and, if well educated, will naturally be interested in reading. Further, Cavan's study shows a higher proportion of subjects who listened to the radio regularly an hour or more each day. The present study shows a higher proportion who never listen, or listen only a few minutes each day. Old people confined in the institution have more free time and might naturally be expected to spend more time in listening to the radio, but since some homes do not provide a radio for each person, some residents

may prefer to stay in their own rooms rather than go to the assembly hall or lounge where they could listen to radio programs. The findings further indicate that old people in institutions attend movies very seldom.

Thus, the study tends to disprove the theory that institutionalized old people have more leisure-time activities and spend more time in listening to the radio, but confirms the hypothesis in respect to their having a greater number of hobbies and in spending more time in reading.

Participation in Clubs and Organizations

Hypothesis: Persons confined in institutions attend few clubs or organized group meetings, participate in fewer club activities and tend to become less active in club work than formerly. Differences in participation in clubs and organizations are indicated in the following items:

Item	Present Study %	Cavan Study %
Participation in club meetings:		
One meeting	27.4	15 5
Three or more	12.0	22.0

Findings show that only about one-half of the subjects confined in institutions attend club meetings, and that their active participation in club activities has declined perceptibly during the past ten years. However, contrary to the hypotheses, a much greater proportion continue to participate in at least one group organization than was found in the control group.

Relation of Age Period to Employment and Occupational Mobility

Hypothesis: Institutionalized old people have passed beyond the age period of their highest paid-job, and, their choice of occupation differed somewhat from that of their husbands. Differences in employment and occupational mobility are indicated in the following items:

Items	Present Study %	Cavan Study %
Occupational distribution:		
No paid occupation	47.8	27.8
School teacher	9.9	4.9
Minister and church worker	6.4	1.7
Professional	9.1	12.4
Business	5.2	9.3
Skilled and semi-skilled worker	7.0	19.5
Unskilled worker	.2	4.5
Farmer	2.0	7.0
Husband's occupation:		
Minister and church worker	14.3	4.8
Skilled and semi-skilled worker	15.5	5.3
Still earn money by working:		
No	70.0	81.6
Part-time	21.7	8.3
Reason for retiring:		
Prefer to work only a part time	4.7	10.2

Findings confirm the hypothesis that there is a close relationship between the age period of the individual and his remuneration for service, institutionalized old people having passed the age period in which they held their best-paying job. Also there is a significant trend toward urbanization of workers.

Economic Status and Feeling of Security

Hypothesis: Persons confined in the institution have a comparatively low economic status and have to make sacrifices because of lowered income, but whatever source of income they may have plus the support from the institution gives them a feeling of comfort and security. Difference in economic status and feeling of security is indicated in the following items:

Items	Present Study %	Cavan Study %
Economic status:		
Comfortable	69.2	58.6
Well-to-do or wealthy	3.5	12.9
Chief means of support:		
Several sources	3.1	38.5
Present earning or savings	15.1	39.5
Living on charity	18.0	12.6
By institution	51.3	4.6
Sense of security:		
Yes	88.3	80.1
No	11.7	19.9

The findings, for the most part, confirm the hypothesis that the economic status of old people living in the institution is comparatively low. They have had to make sacrifices because of lowered income and may feel that their

economic status is low, but the fact that they are living in the institution tends to give them a feeling of permanent security.

Participation in Religious Activities

Hypothesis: The greater proportion of institutionalized old people are affiliated with religious or church groups, attend religious services more frequently, and listen to church service over radio more often than do old people living outside the institution. Differences in participation in religious activities are indicated in the following items:

Items	Present Study %	Cavan Study %
Religious affiliation:		
None	3.0	11.1
Methodist	48.5	19.7
Presbyterian	13.7	9.2
Lutheran	9.1	6.4
Other Protestant	15.3	29.7
Frequency of attending church service:		
Never	7.2	16.0
Once a month	2.6	19.2
Three times a month	6.5	14.2
Once a week or oftener	83.6	50.0
Listening church service over radio:		
Never	4.3	16.1
Once in a while	28.9	54.9
Regularly	66.6	29.0

The present study was limited to cases with Protestant church affiliation, and half of the present sample came from Methodist church homes. Therefore, the difference in the two studies as to church affiliation of subjects is due to the selection of sample.

It is not surprising to find that institutionalized old people attend religious services more frequently than in early life. Confined in the institution, as they are, they have few diversions of interest.

SUMMARY

With the objective limitation, of the sample indicated at the outset of this article, the findings can be generalized as follows:

Institutionalized old people are characterized by more females, more old maids, and widows. They are better educated and apparently have the following advantages: they have good health care, many hobbies, spend much time in reading, are deeply religious, and feel a sense of economic security.

They also have disadvantages: unfavorable family relationships, less contact with friends or young people, less opportunity to participate in group activities, and a resigned conviction that they are through with their careers.

Public Health and the Aging

M. Allen Pond, F.A.P.H.A.

Because of the increasing numbers of aged in the population, diseases of the elderly are becoming a major public health problem. Since little is known about the cause and mechanism of those diseases most frequently attacking older people, the immediate problem is one of gathering and analyzing data concerning the relationships between the environment and the health of the aged. Environmental steps may be taken to safeguard the health of the aged.

Proper housing and one-story dwellings, eliminating stairs, are indicated. Special attention to the elimination of accident hazards is needed. While the physical environment per se seldom produces mental illness, it serves as a contributory factor, and pleasant, safe housing arranged for easy housekeeping is an important mental hygiene measure for older persons.

Environmental Health and the Aging Population. Am. J. Pub. Health 40:27, 1950.

GERIATRICS *Book Reviews*

Postgraduate Gastroenterology

Edited by Henry L. Bockus, M.D., 1950. Philadelphia: W. B. Saunders Company. 670 pages, $10.00

This fine volume is the report of a course given under the sponsorship of the American College of Physicians in Philadelphia in December, 1948. The volume is edited by Bockus and the individual articles are written by many able men.

The principal topics are esophageal disorders, gastric secretion, gastric neoplasms, peptic ulcer, neuropsychiatry in relation to gastrointestinal problems, gastrointestinal allergy, and abdominal symptoms of endocrinal origin. There is a symposium on the pancreas which will be of much interest to many physicians. There are symposia also on the mechanism and significance of abdominal pain and on the diseases of the liver, stressing the recent advances in diagnosis and treatment of hepatitis. There is a review of what is now known about nonspecific enteritis and enterocolitis, also a discussion of intestinal obstruction, and a symposium on jaundice and post-cholecystectomy syndromes. There is much on ulcerative colitis and neoplasms of the colon. The book is well written, well printed and well illustrated, and it will constitute a fine addition to any physician's library.

In the first chapter it is stated that heartburn is often related to a diaphragmatic hernia. This was not found on previous studies of heartburn. There is much on the present day handling of malignant lesions of the esophagus. Fortunately, surgeons are now able to remove the lower part of the esophagus, perhaps pulling the stomach up into the thorax to make the necessary connection. The difficulty, of course, is to find cases in which metastasis has not already taken place. In one series of 26 carcinomas resected, the over-all mortality rate was about 23 per cent.

Schoen gives a good discussion of the parasympathomimetic drugs and their effects on gastric secretion. Most of these drugs continue to have the same effect after vagotomy as they had before. Prostigimine, however, may have a reversed action. Hence it should not be used after bilateral vagotomy for the purpose of stimulating gastric emptying as it is likely to work unfavorably.

Lorber describes the actions of a drug, dibutoline, which promises to control night secretion in cases of peptic ulcer. It is effective when given by mouth and has a strong atropine-like effect. Dr. Franklin Hollander has a good article on the secretion of mucus by the stomach in health and disease. This is an important subject because mucus tends to combine with acid and to protect the mucosa. The pH of the mucus is about that of blood, and 100 ml. will neutralize 35 ml. of tenth-normal hydrochloric acid.

Harry Shay discusses some fallacies in the clinical measurement of gastric secretion, especially when using histamine as the stimulus.

On page 110, reference is made to the interesting observation of Comfort, Butsch and Eusterman that there is good evidence to show that patients with achlorhydria are much more likely to get a carcinoma of the stomach than are persons who have normal acidity.

On page 111, there is a discussion of the old question, "Do cancers develop in benign gastric ulcers?" The essential point in the argument is to be found in Jordan's statement that in the cases of 211 persons operated on and found to have a benign ulcer, 42.1 per cent were diagnosed clinically as having carcinoma, and in a group of 131 patients operated on for supposed benign ulcer, 26 really had a cancer. Obviously, the only sure way to tell if a patient has cancer of the stomach is to remove the lesion and have it sectioned.

Finkelstein has an article on the sometimes difficult roentgen diagnosis of duodenal ulcers in the postbulbar region which can be missed easily by the examiner.

Many physicians will be interested in Berk's discussion of the buffering ability of hydrolysates of protein in cases of peptic ulcer. His work indicates clearly that these hydrolysates have splendid buffering action, better than that of other substances. However, they produce later a rather marked stimulation of acid secretion.

Friedman discusses the value of enterogastrone and urogastrone in cases of peptic ulcer. He feels that the results have not been encouraging. This agrees with the results of some other workers. Schoen discusses in detail the effects of vagotomy on gastric secretion. His article contains information not easily obtainable elsewhere. Ravdin, a surgeon, was not sure that vagotomy improves the results obtained with gastroenterostomy. Bockus, an internist, agreed with Ravdin that vagotomy might be used in the cases of persons with a jejunal ulcer, but he was skeptical about the results obtained even in these cases.

Machella thought that the dumping syndrome is associated with the introduction of hypertonic solutions into the jejunum. Actually, most of the patients with this syndrome

soon learn that they must not add much sugar or salt to their food.

There are two interesting articles by Stewart Wolf and Edward Weiss on the profound effects of the mind on the digestive tract.

The titer of serum lipase tends to go down with carcinoma of the pancreas. The giving of secretin helps in diagnosing pancreatic disease. According to Bockus, persons who have had an acute attack of pancreatitis are likely to have trouble later. According to Berk, the symptoms of cancer of the body and tail of the pancreas are pain, weakness and fatigue, loss of appetite, nausea, vomiting, constipation or diarrhea, and mental depression. The age is about 60 years, and highly important is the fact that usually the patient is dead within seven months after his symptoms begin.

Interesting are the articles on hepatitis, on the physiology of intestinal obstruction, on lysozyme and on pitfalls in x-ray diagnosis.

WALTER C. ALVAREZ, M.D.
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Comroe's Arthritis and Allied Conditions

Edited by Joseph L. Hollander, M.D., Fourth Edition. 1949. Philadelphia: Lea and Febiger. 1108 pages, $16.00

This new edition is the fourth in nine years and has been completely revised and rewritten by Doctor Hollander and sixteen collaborators who are authorities in the field. Seven new chapters have been added dealing with collagen diseases, palindromic rheumatism, Reiten's syndrome, rehabilitation of the arthritic patient, pregnancy in arthritis, rarer forms of metabolic arthritis, and joint physiology. This edition also contains new discussions on psychogenic rheumatism, physical signs of joint disease, normal aging of joints, osteoporosis, the shoulder-hand syndrome, postgonorrheal rheumatoid arthritis, and the newer methods of treatment of various forms of arthritis. A brief discussion is included on the recent revolutionary discovery of the effects of adrenal cortical hormone (compound E) and pituitary adrenocorticotropic hormone (ACTH) on rheumatic diseases.

For those whose reading time is limited the summaries are "boxed," a feature retained from past editions.

An attempt is made to include all disorders that might produce pain and stiffness in the musculoskeletal system. For this reason this volume should be of interest not only to the general practitioner but to everyone practicing medicine.

RALPH E. WORDEN, M.D.
Minneapolis, Minnesota

Length of Life

Louis I. Dublin, Ph.D., Alfred J. Lotka, D.Sc., and Mortimer Spiegelman, F.S.A. Revised edition, 1949. New York: The Ronald Press Co. 379 pages. $7.00

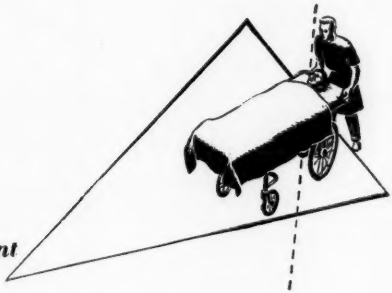
The first edition of this book was warmly welcomed in 1936 as a contribution of great value in clarification of what had been achieved through the ages in increasing human longevity. Quantitative definition of the march of progress in such matters is elegantly summarizable in the form of the life table. This medium was extensively and most effectively used without swamping the reading audience with non-essential technicalities. The present revision, in which Spiegelman joins the authorship, brings the discussions up-to-date on a comprehensive basis. There is no difficulty in agreeing with the authors' prefatory statement that "the book has been virtually rewritten." The result is that a commendable work has grown in professional stature.

There is no need to emphasize here the profound implications of the rapidly increasing proportion of our population in the maturer ages. Adequate understanding of the attendant problems with respect to their full present magnitude and inevitable progression toward greater magnitude in the near future will not exist without careful study of such facts as the authors lucidly present here. The 1950 census will probably show very nearly 8 per cent of our population to be over 65 years of age, a value 3 times what it was a hundred years ago. Reading this book impresses the reviewer with the likelihood that the official forecast of the Census Bureau for a slightly higher increase (to 13.3 per cent) in the next half century errs in the direction of understatement. The analyses of the authors respecting facts of the past impresses one deeply with perception of fundamental accomplishment that must surely continue with steady if not accelerating pace. Burdens of the changing situation will fall inevitably with increasing weight on the shoulders of the profession which this journal seeks to serve.

The book is written for laymen as well as for the medical, public health and actuarial professions. Its value lies not alone in quantitative specification, but also in broad orientation. This reviewer regrets that the revision has curtailed the use of charts. Blessed is he who has comprehension of numbers adequate to make this change of no significance.

There will be differences of opinion, of course, when conjectural explanations are offered. One need not be deterred by them, for they are only casual supplements to the main dish and not artifices to cover a void.

ALAN E. TRELOAR, PH.D.
Professor of Biostatistics
University of Minnesota



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DIGESTS *from Current Literature*

Cancer of the Breast in Advanced Age Groups.

BENJAMIN F. BYRD, JR., M.D., *Surgery*, 27:414-416, 1950

About one-tenth of all breast cancer cases occur in patients 70 or more years of age. With the trend toward a more populous old age group, special consideration must be given to this problem. Over a 23-year period, Benjamin F. Byrd, Jr., M.D. found that there was a zero mortality in 22 mastectomies in this age group. This result was achieved in spite of the fact that only two of these patients were free from complications adding to the anesthesia and operative risk. Cardiovascular diseases and arteriosclerosis were the most frequent complications.

Surgery was performed either to cure breast cancer or to palliate the disease by removal of ulceration.

Nitrous oxide-oxygen alone or local infiltration Novocain supplemented by nitrous oxide analgesia are excellent anesthetics for the advanced age group. Since a deeper plane of anesthesia is required for a radical mastectomy, nitrous oxide-oxygen ether is the anesthetic of choice.

The average age of these patients was 73.4 years. The normal life expectancy of females of this age group is 8.69 years. Those who submitted to a radical mastectomy averaged 70 years, with a life expectancy of 10.3 years at the time of operation. Those who showed no evidence of metastasis at operation can look forward to a life realization only slightly less than normal. The group with simple mastectomies had an average age of 74.1 years at operation, with a life expectancy of 8.3 years. This group has a life realization slightly in excess of their life expectancy.

Urgent Abdominal Surgery in the Aged.

CHARLES W. MCLAUGHLIN, JR., M.D., *J. Om. M.-W. Clin. Soc.* 11:25-28, 1950

Major surgery for the correction of urgent abdominal lesions in the aged can be safely undertaken with a reasonable mortality. Physicians must remember that the problems are not comparable to those in younger individuals. Not the least of the difficulties encountered is the tendency of this group to lose interest in life and survival. Prompt ambulation will do much to counteract this reaction.

An acute surgical abdomen in older individuals may not present a distinct, clear-cut entity and frequently will be complicated by attendant cardiorenal disease, arteriosclerosis, diabetes or senility.

In 43 patients 70 years or older who required urgent abdominal surgery, C. W. McLaughlin, M.D. found that acute intestinal obstruction, acute biliary disease and hernia made up 90 per cent of the cases. There were three fatalities.

Elderly patients have a less severe clinical course with acute intestinal obstruction than do younger individuals, pain being less prominent, while distention is the common presenting symptom. A story of vague abdominal pain with gradually increasing distention should always lead the doctor to suspect an obstruction, which can be confirmed by a flat abdominal plate. Intestinal intubation is lifesaving prior to surgery but must not be used for prolonged periods. Colonic obstruction requires surgical decompression.

Cholecystectomy is the treatment of choice, when feasible, for acute cholecystitis in the older group, but cholecystostomy is more often indicated.

Inguinal herniae are readily seen on physical examination, but a small femoral hernia in the elderly female often is overlooked and may be responsible for intestinal obstruction. These cases are usually seen late and require resection.

Studies of the Eye in Old Age. II. Cystic Hole in the Macula: A Clinico-Pathologic Study.

A. L. KORNZWEIG, M.D., and MORRIS FELDSTEIN, M.D., *Am. J. Ophth.*, 33:243-247, 1949.

Cystoid spaces in the outer retinal layer may enlarge, coalesce, and gradually break down the tissues to form an actual hole. Most of the defects reported have been related to chronic inflammation, tuberculosis, injury, or other lesion. Bilateral cystic degeneration of purely senile type was recently observed by A. L. Kornzweig, M.D., and Morris Feldstein, M.D.

A man of 64 with arteriosclerotic heart disease, hypertension, and asthma had corrected 20/40 vision in the right eye but with the left eye could only count fingers at two feet. The right fundus had narrowed arteries and macular stippling but a normal disk and no hemorrhages. The left macula had a hole about half as wide as the disk and surrounding patches of yellowish exudate.

About eleven months later the patient died of bronchopneumonia and both eyes were

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removed for microscopic section. The right macula had almost completely disintegrated. A large cystoid area involved nearly all layers of the retina, although the outer limiting membrane was still intact. The hole in the left eye had progressed no further, but all retinal layers were gone for a space 0.7 mm. in diameter. Edges of the hole were rounded and well defined, and the retina beyond was fairly normal. The pigment layer and choroid were undamaged.

The macular region and ora serrata have the poorest blood supply in the retina and are therefore quickly affected when body circulation and nutrition are impaired. Apparently the small retinal arterioles are gradually obliterated. Macular holes are usually bilateral and thus probably due to an inherent tendency rather than chance.

Neuropsychiatric Diseases of the Aged.

JOHN A. AITA, M.D., *J. Om. M.-W. Clin. Soc.* 11:23-25, 1950

The belief that aged neuropsychiatric patients are necessarily chronic institutional cases is incorrect, the common disorders are amenable to therapy but require careful diagnosis. John A. Aita, M.D., recommends the following treatment in these common diseases of older age groups.

Peripheral nerve disorders: Neuralgias and nerve root pains without specific etiology often respond to physiotherapeutic measures, radiation therapy or Novocain injection. Alcohol injection or resection may be performed later if necessary. Empiric measures include large injections of vitamin B, oral antihistamines and nicotinic acid.

Cerebral vascular disorders: Tragedies result from the easy relegation of every cerebral syndrome in the elderly to the ravages of "old age" or arteriosclerosis. Careful diagnosis and history, radiograms of the skull and spinal fluid examination will suggest needed surgery. Ischemia due to thrombosis, embolism or vasospasm is combated by dicoumarin, aminophylline, papaverine, nicotinic acid, whiskey and stellate ganglion block.

Parkinsonism: Physiotherapy and drugs such as Benadryl or Artane increase comfort and usefulness.

Pernicious anemia and subacute combined degeneration of the spinal cord is an insidious and disabling disorder, often missed because the blood may appear normal. The condition must be suspected in every patient complaining of symptoms in the extremities, especially the lower. Gastric analysis, sternal marrow examination and reticulocyte response to liver extract are helpful in diagnosis. Patients must remain on adequate parenteral replacement therapy.

Psychiatric disorders: The most common psychoses in the aged are manic-depressive disease and involutional melancholia, both of which often respond miraculously to electroshock, which is well tolerated by the elderly. Psychoneurotic older patients are often responsive to psychotherapy; employment and a feeling of usefulness are the best preventive measures.

Geriatric Anesthesia.

BERNARD S. GOFFEN, M.D., and PAUL M. WOOD, M.D., *Am. J. Surgery* 78:475, 1949.

Individualization and attention to minute details in anesthesia is required in handling elderly patients.

Senescent changes in the respiratory, cardiovascular, and excretory systems alter normal homeostatic mechanism responses. Pulmonary aging is manifest by chronic hypoxia, decreased number of functioning alveoli, and impaired permeability of alveolar walls. Emphysema, lowered tolerance to depressant drugs, and loss of normal bronchial mucosa predispose to hypostasis, atelectasis, and retention of secretions.

Cardiovascular changes in aging include cardiac irregularities, vascular spasms, and diminution of blood supply to vital organs. Hypertension, decreased vagal or sympathetic responses, and increased tendency for thrombosis and embolism are products of aging and become important in contemplation of anesthesia.

Toxic drug actions are enhanced by slower absorption, lowered oxidative destruction, and hindered respiratory and renal excretion in elderly patients. Usage of depressant drugs, therefore, requires caution and careful evaluation.

Premedication is employed to lower metabolic rate, allay anxiety, lessen secretions, and diminish reflex activity. By taking advantage of the already lowered metabolic rate of the aged and increasing the anesthetist-patient rapport, harmful dosages of drugs can be avoided.

The Aged Sick.

J. M. GREENWOOD, M.D., *The Lancet* 257: 1047, December 3, 1949.

Generally speaking, the longer the patient has been bedfast, the less are his chances for recovery, but even patients who have been long bedfast can be improved in spite of hemiplegias, incontinence or parkinsonism.

Since the great difficulty in treating chronic aged patients is to find suitable quarters for them when they no longer need continuous medical and nursing care, J. M. Greenwood, M.D., suggests that three chief things are needed for their proper medical care: 1. active geriatric units attached to general hospitals with additional accommodations for long-stay patients; 2. outpatient units; and 3. home nursing service.

GERIATRICS

Studies of the Aging Heart*

Paul Kaufman, M.D., F.A.C.P., *and Harvey Poliakoff,* M.D.

RECENT investigations into some phases of normal and pathological physiology of the heart have given the clinician a better understanding of the precongestive and congestive stages of heart diseases. It is now realized that a decline or failure in the function of the heart may be attributed not only to a decline in motor power, but to other factors which play an equal or even more dominant role. Some of these factors are: increase in blood volume, venous congestion, pulmonary-cardiac reflexes from a rise in pulmonary arterial pressure, and primary or secondary changes in the kidneys, endocrine glands, bone marrow, and liver. In the aging individual, general atrophy of cardiac and other muscles or organs, decrease in the number of capillaries (both of which cause anoxia of central and peripheral origin), and general decline of functional capacity of the body, assume a primary importance among these other factors.

AS A result of work done on the medical wards of this chronic disease hospital, certain conclusions can be drawn as to routine management of the old age patient with cardiac disease. Analysis of post-mortem records and detailed clinical studies[1] have been made to help improve the management of patients of this age group. First, consideration must be directed to the major acute alterations in pathologic physiology such as congestive heart failure, coronary insufficiency, peripheral failure and abnormal rhythm which might require emergency measures. Second, the clinician may direct his attention to treatment of etiology and general management of the patient.

CONGESTIVE HEART FAILURE

IN CONGESTIVE heart failure, all cardiac patients are urgently in need of a well planned therapeutic regime. Some patients are seen in severe failure.

*From the second medical division of Goldwater Memorial Hospital, New York City.

The first part of this study was published in the Annals of Internal Medicine, May, 1950, p. 889.

Others have a past history of congestive failure. A third group has a serious structural disease which may lead to congestive failure. In a post mortem study of 200 autopsied patients from this hospital, it was found that heart disease was a clinical problem in 116 or 59 per cent. In 51 or 25 per cent heart disease was the chief cause of death. *Autopsy, however, showed pathological criteria of heart disease in 175 or 75 per cent of all cases.*

Congestive heart failure may be present in all etiologic types of heart disease. Back failure causes dilatation of cardiac chambers, high auricular pressure, low output (except in those complicated by fever, severe anemia, thyrotoxicosis, or cor pulmonale), high venous pressure, increased circulation time, and congested organs.[2, 3] Forward failure results in decrease of renal excretion of sodium and water with resultant edema.[4]

IT SHOULD be remembered that the body will accumulate about ten to 20 pounds of water before edema is manifest.[5] Dyspnea, cough, and paroxysmal nocturnal dyspnea often precede manifest edema. Latent edema should be suspected with any unexplained gain of weight. Long lasting pressure marks from stockings, belts, and garters are good sign posts of early fluid accumulation. Treatment should precede the stage of manifest edema.

Patients with congestion or on the verge of congestion need digitalization, low sodium diet, fluid restriction, O_2 inhalation, diuretic treatment and restriction of activity. The milder cases may require only one of these measures. More severe cases will require rigid use of all therapeutic measures. In general, it is preferable to try rest and digitalis first. This is simple for the patient and requires little dislocation of his life. Powdered leaf may be given and maintained by the Eggleston method.[6] Periodic checks will determine whether the patient is being given too little or too much. The newer purified glycosides such as Digoxin, digitoxin or lanatoside C are simpler to administer. Each clinician should learn the properties of one preparation. Quick oral digitalization with one dose of 1.2 mg. of digitoxin[7] is safe. It often accomplishes full digitalization, which may then be maintained by daily doses of 0.1 to 0.6 mg. Most patients in younger age groups, however, require more than 1.2 mg. for initial digitalization. Patients in the older age groups, usually need less by the intravenous route, and more by mouth.

For emergencies, in patients with acute left ventricular failure, or right and left heart failure, intravenous digitalization is safe and usually effective. Ouabin (or strophanthin) has a long record of effectiveness. One must be certain the patient has taken no digitalis preparations for one to two weeks prior to using this drug. An initial dose of 0.5 mg. is followed each half hour by doses of 0.1 mg. until there is either toxicity or evidence of full digitalization.

We have also found intravenous lanatoside C safe, effective, and simple to administer. There have been recent studies showing its safety in patients having digitalis in their systems.[8] Six years ago, we made detailed clinical

studies on this drug in 14 patients; however, war conditions prevented earlier publication of the results. Patients were all in the older age group. All were in failure. Twelve were fibrillating and none had digitalis in his body. A single dose of eight cc. (1.6 mg.) was given intravenously. Table I shows our findings. Clinical effects and effect on ventricular rate were noted in from two to 12 minutes after administration. Maximum effects, consisting of clinical improvement and ventricular rate under 100 was noted in from 16 to 90 minutes. After full digitalization, a vagal blocking dose of atropine[9] (2 mg. intravenous) was given to three patients. In only one did ventricular rate rise over 100. This dosage, therefore, was sufficient to cause full digitalization with extravagal effect in many cases. Circulation time studies and clinical observation proved good clinical effect was obtained. Toxicity with this dose was minimal. Of the fourteen patients, one complained of nausea and two others vomited more than once. In two of the fourteen, a reversion to regular sinus rhythm was effected by intravenous lanatoside C. *Clinical response was thus excellent in 12 of the 14 patients and objective studies confirmed this finding.*

Low salt diet with total NaCl intake under one gm. is preferable to fluid restriction. Extra fluid intake and acid ash diet may further increase the efficiency of the low salt regime.

Diuretics are the next line of attack. Daily doses of four to six gm. of ammonium chloride are sufficient to control many patients. Early in the treatment the patient should be given a test dose of 0.5 cc. of Mercuzanthin intravenously or mercuhydrin intramuscularly, or 0.5 cc. of theomerin subcutaneously. Thereafter dosage may be increased to a maximum of two cc. daily or a minimum of one cc. per week depending upon the patient's state. Weighing the patient daily will provide the best guide to adequacy of therapy and to size of the maintenance dose. The seriously ill patient will also require oxygen, sodium-free diet, digitalization and rest. Strict rest in a chair is preferable to bed rest, especially in the older age group. Chair rest will also direct more edema to the legs and less to the lungs, thus preventing pulmonary edema.

Other useful measures for congestive failure should be mentioned. Oxygen by B L B mask should be used if there is marked cyanosis or dyspnea at rest. Acute left failure usually responds to the relaxing effect of one dose of morphine. Intravenous administration of digitalis or phlebotomy are adjuncts to treatment in the more severe cases of acute left failure. When fluid in the chest impedes respiration, paracentesis is indicated. Southey tubes will remove fluid from the extremities in the stubborn cases.

Patients who do not respond to any of these measures may have associated renal pathology. We found nephrosclerosis in 36 per cent of our patients dying from heart disease. Chronic pyelonephritis was found in 20.5 per cent of the entire series and in 23.3 per cent of those with heart disease. Other causes for poor response are rheumatic activity, severe anemia, thyrotoxicosis, avitaminosis and Kimmelstiel-Wilson syndrome.

TABLE I.

EFFECT OF INTRAVENOUS CEDILANID ON AGED PATIENTS

Case No.		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Age		64	68									73	34	70	76
Sex		M	M										F	M	F
Etiology		Hyp.	Hyp & As.	As.	Hyp. & As.	As.	Hyp. & As.	As.	As.	As.	As.	Hyp.	Rheum.	Hyp.	As.
Class 1—[1]		4E									4	4E	4E	4E	4E
Fibrillation		over 3 yrs.	5 mos.	un-known	not fibril-lating	un-known	un-known	un-known	over 3 mos.	not fibril-lating	over 1 yr.	over 3 yrs.	un-known	un-known	un-known
Dose mg.		1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.2
V. rate before drug—[2]		148	124	116	100	97	108	98	168	120	120	108	160	142	126
Min. for v. rate to decrease over 10—[3]		4	2	4	—	8	6	12	6	9	6	2	9	3	7
Min. for max. fall in v. rate—[4]		45	120	90	—	15	40	35	40	480?	16	22	45	45	48
Effect of atropine 2 mg. v. rate rise to		—	—	72 to 104	—	—	72 to 86	—	—	—	—	—	—	78 to 86	—
Days v. rate under 90		4	1	3	—	7	5	—	3	—	—	5	—	—	—
Ether	Before	10	12		—	8		7	11	10	—	8	—	9	—
Time	After	4	4	4	—	8	—	—	6	8	—	—	—	7	—
Cyanide	Before	22	28	18	—	28	18	37	24	40	—	34	—	38	—
time	After	16	—	13	—	—	—	—	—	24	—	—	—	—	—
Clinical remarks		Imp.	Imp.	Vomited once	Slight nausea Imp.	Vomited once Imp.	Slight nausea Imp.	Imp.	Rhythm became regular	Nausea Imp.	Quest. Imp.	Imp.	Imp.	Imp.	Rhythm became regular

Rheum.—Rheumatic heart disease
As.—Arteriosclerotic heart disease
Hyp.—Hypertensive
Imp.—Improved
Quest. —Questionable

1—Classification N. Y. Heart Association
2—Ventricular rate before administration of drug
3—Minutes for ventricular rate to decrease, over 10 minutes
4—Minutes for the maximum fall in the ventricular rate

CORONARY INFARCTION

ACUTE infarction was present in 9.5 per cent of the entire series of those with heart disease and in 36 per cent of those dying directly of heart disease. It requires individual, strict management. Suspected cases should be treated for infarction until it is ruled out. The minimum requisite calls for four weeks of bed rest followed by two weeks of chair rest. All pain should be relieved immediately. This will require one-half to one grain of morphine in the first few hours. Digitalis should not be used except where congestive failure follows. Patients should be closely watched for frequent premature contraction or ventricular tachycardia. These are considered as fibrillating patients and are treated with quinidine. (See below under Abnormal Rhythm.)

Oxygen is helpful in all cases of infarction. Infarction and anginal pain are results of low oxygen supply to the myocardium. One hundred per cent oxygen by mask is the method of choice. Oxygen is given until pain, cyanosis and dyspnea are controlled.

EXTENSIVE studies conducted at the present time[10] seem to indicate that heparin and dicumarol should be used routinely in myocardial infarction. Although our experience with these drugs is limited, the reports are favorable at present. We use them in all cases in which there is suspicion of extension of infarction, embolization or phlebothrombosis. However, one must have good laboratory control facilities to use these anticoagulants safely. Jorpes[10a] suggests that the action of heparin is due to the high negative electric charge of the polysaccharide, chondroitin sulfuric acid, which with its two components, uronic acid and glucosamine comprises 90 per cent of the skeleton of heparin. The proof for this physico-chemical action was furnished by Chargoff and Olson[10b] who found that protamin, a compound with strong positive electric charge, neutralizes the negative charge of heparin. If the coagulation time has become unduly prolonged, Jorpes[10a] indicated that 50 to 100 mg. of protamin sulfate in one per cent solution given intravenously will instantaneously reduce it to normal. The dosage of heparin should be sufficient to prolong the clotting time to three times its normal value by the Lee-White technic. Daily doses ranging between 250 and 325 mg. are usually sufficient to achieve this end. Dicumarol as advised by Wright et al[10] is given in doses of 50 to 300 mg. according to the prothrombin time. Between 30 and 35 seconds, 50 to 100 mg. is given; if the time is less than 30 seconds, 200 mg. is given daily until the prothrombin time reaches 30 seconds (according to the Link-Shapiro technic).

In infarction, when the blood pressure remains under 80 for several hours, injection of 50 cc. of 50 per cent glucose is useful. If there is no response to this, we use slow infusions up to 250 cc. of plasma.

CORONARY INSUFFICIENCY

PRECORDIAL pain is a sign of temporary or permanent insufficiency and should be treated accordingly. In this discussion we exclude the type of precordial pain due to acute pericarditis or psycho-neurogenic factors.

The management of the milder forms will respond to simple procedures. Patients must restrict activities to the point where this symptom is avoided. General treatment directed to improvement of nutrition and prevention of coincidental infarction will increase coronary oxygenation and thus decrease angina. Avoidance of large meals, emotional tension, and exposure to cold weather must be recommended. Most patients will do better on a non-smoking regime. Specific minor attacks of pain will respond to light stroking of the skin of the precordial region. This causes vasodilatation through the viscero-cutaneous reflex; more severe pain will require ¼ to ½ mg. nitroglycerine. Anticipated attacks may be prevented with erythro-tetranitrate. Single portions of whiskey and brandy also cause generalized vasodilatation and a sense of well-being. When precordial pain is prolonged and infarction is suspected, nitroglycerine is discontinued immediately. Under such circumstances the lowering of blood pressure is harmful. Prolonged attacks of precordial pain, which do not constitute actual infarction, require careful management. These prolonged attacks often precede an infarction and, in any case, denote serious deficiency of myocardial oxygenation. In such cases several days of rest in bed with frequent administration of oxygen is desirable. As a daily routine, aminophylline, papaverine, testosterone propionate, amyl nitrite, nicotine acid and erythrol tetranitrate enjoy wide use. It should be emphasized that anginal pain is a symptom which must be treated in order to avoid anoxemia and degeneration of heart muscle. Phlegmatic patients with little pain sensitivity must not obey their impulse to carry on, in spite of the absence of symptoms. Each attack should be treated, since it sensitizes the heart for following attacks. Occasionally, anginal pains are severe and frequent; they may respond poorly to all drugs with the exception of narcotics. In such cases, the block of afferent nerve impulses with alcohol, paravertebral block, or neurosurgery is recommended. We have seen this procedure rehabilitate serious invalids. Other surgical procedures for increasing myocardial blood supply have been described in the literature but none has been widely employed. The same may be said for thyroidectomy and propylthyouracil therapy.

ABNORMAL RHYTHMS

Auricular fibrillation was present in 16 per cent of all cardiacs and in 14 per cent of all patients in this series. Its onset may precipitate failure, or may indicate coronary thrombosis. Occasionally, improvement of a cardiac patient with digitalis and restriction of stimulants may cause cessation of this abnormal rhythm. In general, heart failure of patients with fibrillation responds well to digitalization. Most patients with fibrillation of the auricles acquire a mural thrombus and are candidates for embolization. In cases without manifest failure and with fibrillation of duration under six months, measures to restore sinus rhythm are advisable. Quinidine in dosages of 0.3

gm. t. i. d. may be tried. If this is unsuccessful, an increase to 0.6 gm. every hour for six doses may help. Recently it has been suggested that the same treatment is advisable in advanced cases of heart failure with episodes of embolism and poor response to treatment. In such instances, digitalization should precede administration of quinidine. Cases have been reported in which restoration of normal rhythm restores moribund patients to useful lives.[11]

Ventricular fibrillation is rare. When present it is usually a serious complication of myocardial infarction. The patient may simulate clinically the Stokes-Adams picture. In such cases, however, epinephrine or ephedrine is contraindicated, while quinidine sometimes helps.

Auricular premature contractions may be present in normal or diseased hearts. They require no treatment. Ventricular premature contractions which do not disappear after exercise usually signify disease. After myocardial infarction, frequent VPC's are a forerunner of ventricular paroxysmal tachycardia or ventricular fibrillation. Quinidine usually will forestall such a possibility.

Paroxysmal tachycardia presents an additional strain in heart disease. The auricular type responds well to carotid sinus or eyeball pressure. In stubborn cases, one should try Mecholyl. If there is a history of failure, digitalis is advisable before using this drug. Ventricular tachycardias are more serious omens. Quinidine is the drug of choice in these cases. Heart block requires treatment for the underlying disease only. Cases with Stokes-Adams syndrome will improve with ephedrine in doses of 25 mg. t. i. d. During attacks adrenalin 0.5 to 1.0 cc. subcutaneously is effective.

OTHER SYMPTOMS

Paroxysmal nocturnal dyspnea is often an early indication of congestive failure. It must be differentiated from nightmare, anxiety, hysteria, and bronchial asthma. Digitalization or salt-free regime will usually control this symptom. At the time of attack, morphine is the drug of choice.

In coronary heart diseases, essential hypertension or aortic insufficiency, dizziness or light headedness is frequent especially after prolonged bed rest. This symptom is difficult to treat. Many attacks are due to delayed postural reflexes. Patients may avoid them by changing position very slowly. An occasional case will be due to carotid sinus sensitivity. These patients may be advised to wear loose collars or take small doses of atropine. Caution should be used in testing carotid sinus sensitivity in the aged. Serious cerebral damage may result from pressure of only a few seconds' duration.

Indigestion and heartburn are uncomfortable and common. One must think of congested viscera, digitalis toxicity or anginal equivalent. The differential diagnosis is often difficult. In order to avoid alkalis containing sodium when on the salt-free diet, patients may use magnesium, bismuth or aluminum alkaline powders. Constipation must be treated since straining at stool often causes angina or pulmonary embolus. When indigestion is per-

sistent, organic disease of the stomach, intestines and gall bladder should be sought.

ETIOLOGY AND TREATMENT

Hypertensive heart disease represented clinically 84 or 42 per cent of this group of 200 consecutive autopsies and 48 per cent of those with pathological evidence of heart disease. It should be realized that hypertensive heart disease is just one manifestation of a systemic disease picture with cardiac, vascular, cerebral, emotional, renal and other aspects.[12] These conditions and the heart failure may have little or no correlation to the height of the pressure. Treatment of the patient and his troubles, not a lowering of the blood pressure, represents the chief necessity and in achieving this end, mild sedation, physical and mental relaxation are helpful. In resistant cases, a trial of low sodium diet is indicated. The rice diet is a convenient form of low sodium diet, but should not be used in cases with renal failure and nitrogen retention.

Arteriosclerotic or coronary heart disease was present in 146 or 73 per cent of our series of consecutive autopsies and 83.4 per cent of the total with autopsy evidence of heart disease. There are indications that high fat and high cholesterol diet favors this development. There is experimental evidence also that low thyroid activity increases the incidence of atherosclerosis. Diabetics are prone to premature or increased incidence of atherosclerosis, and is believed by some that rigid control of diabetes will lessen the incidence of atherosclerosis but this has not been proved conclusively. Clinical application of these experimental facts is not yet available, but there is a strong expectation that such application is forthcoming soon. Several operations have been devised to increase coronary and collateral circulations but none of these has gained widespread use.

Rheumatic heart disease represented 25 or 12.5 per cent in this series of consecutive autopsied patients and 14.4 per cent of those with heart disease. In another study, it was found in 19 per cent of 263 consecutive autopsies.[1] These studies also indicate that active rheumatic fever is not uncommon in old age. Rheumatic heart disease will be found more frequently if a search is made. Although activity with acute polyarthritis is uncommon, activity with carditis is not a rarity. Active acute rheumatic myocarditis often accounts for lack of response to therapy in heart failure. Restriction of physical activity is the required treatment. All associated infections of ear, nose, throat, gall bladder, prostate, cervix and teeth should be treated properly. Large doses of salicylates may be effective. Between the bouts of activity it is often wise to use prophylactic doses of sulfadiazine one gm. daily.

Luetic heart disease occurred in 11 or 5.5 per cent of our series of consecutive autopsied patients and 6.3 per cent of 115 cardiac patients. After the onset of aortic insufficiency or coronary stenosis, prognosis is poor. However, active antiluetic treatment might increase longevity and should be used in all cases. A preliminary course of six weekly intramuscular injections of 2 cc. bismuth

subsalicylate in oil is advisable to avoid therapeutic paradox. After this, a gradually increasing dose of penicillin is the treatment of choice. Where there is little cardiac failure, one may give full course of 600,000 units of penicillin in oil daily for 14 successive days.

Bacterial endocarditis was fairly frequent in this series. Proper management requires isolation of the offending organisms and determination of their sensitivity to the effective antibiotics such as penicillin, streptomycin, and sulfadiazine. Initial intensive treatment with 1,000,000 units of penicillin daily in equal doses at three-hour intervals for a period of three weeks should be started. As soon as sensitivity is known, dose and drug may be altered. In vitro sensitivity is often deceptive. If clinical response is inadequate or relapse follows, the dosage should be increased five-fold or ten-fold. Dosages as high as 20,000,000 units daily may save lives. Caronamide effectively increases the penicillin blood level, but its peculiar taste makes administration difficult for periods over more than seven to 14 days.

Hyperthyroid heart disease in older patients is usually associated with adenoma. Diffuse hyperplasia is a disease of younger age groups. Malignancy is common enough to represent a difficult problem. If the patient's condition permits, surgery is the treatment of choice. Poor risk patients may be treated effectively with propylthiouracil. Myxedematous heart disease is uncommon in this group. We observed two cases recently in detail. It may be associated with normal or elevated pressure. Thyroid is the specific medication; however, initial dosage must be small as angina can be precipitated by its use. The anemia associated with it usually requires separate treatment.

Beriberi heart disease is also rare. Moderate degrees of avitaminosis (especially deficiency in riboflavin, nicotinamine and thiamine) are commonly seen in these patients. Large dosages of B complex will often give a surprising relief in the debility, malaise and anorexia which is seen as a complication of other types of heart disease. The vitamins should be given parenterally if absorption is unsatisfactory due to congestion of visceral mucosa. Stigmata of avitaminosis such as corneal injection, dry skin, anorexia and weakness should be sought for this age group.

PSYCHOSOMATIC TREATMENT

OLDER PEOPLE have fixed habit patterns and personal ideas concerning the cause and treatment of their illness. Successful management calls for careful education of the patient toward flexibility of routine and a great deal of equanimity, as that great clinician of the last generation, Osler, emphasized. Not only patient-ideas, but family customs and environment, must be studied and handled in the best practical manner. Rest and activity are fundamental problems. The appearance of edema, dyspnea, cough, nocturnal paroxysmal dyspnea and angina are basic warnings, as all of these indicate reduction of activity. Depending on the functional capacity of the heart, which can be learned only from prolonged observation, a routine must be evolved. This

will require a certain number of hours of bed rest, a certain number of hours of chair rest, and a certain amount of exercise. Included in the exercise will be walking, stair climbing (if absolutely necessary), remunerative work and recreation. If the underlying disease progresses favorably, permissible exercise increases. Fixed tissue changes are usually present, however, and the patient will be forced to accept a maximum of activity beyond which there will be no increase. It behooves the physician to recognize this as early as possible and to attempt to make the patient face it realistically. He must restrict his activity to this maximum, and also his ambition, his income and his recreation habits. Restriction of activity is aided by nursing care, hospital type bed, bed pan, home elevator, wheel chair and the habit of slow walking. Acceptability is aided by hobbies such as knitting, embroidery, reading, radio, television, painting and puzzles. Since the restricted patient may not sleep well, mild sedatives with long acting barbiturates or bromides are advisable but one must be careful to prevent accumulation of the sedatives. Poor renal function and fluid restriction may increase this definite hazard.[13] We have seen sedatives as the cause of patients' complaint of weakness or lethargy; others have described toxic psychotic symptoms.[14] However, the careful use of sedatives is helpful and often necessary.

ABUSE OF REST and insistence on too much bed rest is dangerous. Phlebothrombosis and pulmonary embolism are important problems for the bedridden medical patient. Pulmonary embolism, an important cause or contributory cause of death, was found in 14 of 200 consecutive autopsies from the medical service of our division. Complete immobilization in bed may be avoided for the elderly patient, especially for the one with heart disease, pulmonary congestion and slowed circulation, if judicious activity and chair rest are prescribed as soon as possible. The ambulant patient can learn to regulate his own activity, if he is taught to recognize the danger signals such as precordial distress, dyspnea and nocturnal paroxysmal dyspnea.

The presence of heart disease inspires fear in anyone and especially in the elderly patient. This is to be expected, since heart disease kills so many people and often causes sudden death. However, fear and worry decrease cardiac efficiency and add to the burden of the disease. Attacks of anxiety-hysteria may also complicate the diagnosis of heart disease. These must be differentiated from paroxysmal nocturnal dyspnea since different treatment is demanded in the latter case. The latter may require salt restriction, digitalization or mercurial diuretics; the former requires psychotherapy or sedation. An optimistic outlook must be presented to the patient as an aid to recovery. The recent trend, showing increased longevity after onset of heart failure or coronary thrombosis, justifies this outlook. The possibility of sudden death or short life span may be explained to the family, but harm will result if the patient worries excessively.

The nutrition of the patient demands care since obesity is a hazard in

all cases. It may also mean fatty deposits in the myocardium and elevated diaphragm with resultant decrease in the efficiency of the thoracic organs. Life insurance statistics emphasize that slight underweight means greater longevity.[15] Thus, low caloric, low fat diets are usually advisable.

SUMMARY

A detailed report on the treatment of the older patient with cardiac disease, as practiced on one of the services of Goldwater Memorial Hospital, is given. The report is based on the analysis of postmortem records and on the clinical observation of the oral and intravenous use of different digitalis preparations, mercurial diuretics, anticoagulants, antibiotics, and other forms of routine therapy. It is pointed out that the work of several investigators here and abroad has resulted in better understanding of the underlying pathological physiology of heart disease and in its better management.

The specific problems to be faced when treating old age cardiac patients are indicated, and some suggestions for the treatment of acute emergencies and for the management of the chronic conditions are given.

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Effect of Blood Cholesterol Disorders on the Coronary Arteries and Aorta

Lester M. Morrison, M.D., *and William F. Gonzalez,* M.D.

THERE IS increasing evidence that a disturbance in cholesterol and lipoid metabolism is important in the pathogenesis of coronary artery sclerosis and generalized arteriosclerosis.[1-10] Previous reports by Morrison, Hall and Chaney,[11] and Morrison, Langmade and Chaney[78] demonstrated the frequency of hypercholesteremia in patients with acute coronary thrombosis, when the blood serum cholesterol and ester levels are ascertained by the Sperry-Schoenheimer procedure as modified by Chaney and Lovell.[12] This supports previous observations which also note the incidence of hypercholesteremia in coronary artery sclerosis.[13-20] A large amount of data has accumulated demonstrating the increased incidence of coronary artery sclerosis and arteriosclerosis in diseases characterized by chronic hypercholesteremia. These diseases are, in particular, diabetes mellitus,[21-30] myxedema,[31-40] nephrosis,[41-50] and xanthomatosis.[51-59]

IN ORDER to learn more about disordered cholesterol and lipoid metabolism in the pathogenesis of arteriosclerosis, it was decided to determine the effect of a disease characterized by chronic hypocholesteremia on the coronary arteries and the aorta. If the previously stated concept is valid, the coronary arteries and aorta in chronic hypocholesteremia states should be less arteriosclerotic than the normal subject or other chronic illness subject of the same age and sex. No known data on this subject appears to be available. Experimental studies by various observers have demonstrated that atherosclerosis is readily produced in rabbits by the feeding of cholesterol in the diet. This atherosclerosis is identical with that occurring in humans. Studies by Steiner,[74] by Broun, Andrews and Corcoran,[75] and by Morrison and Rossi[76] have shown that this experimental atherosclerosis can be prevented by the simultaneous feeding of choline together with the cholesterol. Morrison and Rossi further demonstrated that once atherosclerosis had been produced under these experimental conditions, choline would cause an absorption of the atherosclerosis, provided an adequate dose of choline was used.[77]

Accordingly, the coronary arteries and aortas in a series of 590 patients who had died of various diseases were examined post mortem at the Los Angeles County General Hospital and studied and analyzed. This series was divided into six groups of patients—those dying from (1) sudden death, as

*Presented before the annual A.M.A. Convention, section on pathology and physiology, Chicago, June 25, 1948.

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Aided by grants from Commercial Solvents Corporation Pharmaceuticals, and the Council on Chemistry and Pharmacy of the American Medical Association, Committee on Therapeutic Research.

in acute surgical or infectious disease, (2) chronic diseases other than separately classified herein, (3) diabetes mellitus, (4) chronic thyrotoxicosis, (5) cancer, and (6) "alcoholic" cirrhosis of the liver.

With the exception of the chronic thyrotoxicosis group, each series presented approximately the same number of patients with a roughly comparable age distribution from 20 to 75 years. The patients were selected in the chronological order listed in the autopsy files of the hospital from the year 1932 to 1947. The degrees of atherosclerosis of the aorta and coronary arteries were graded according to the description of the pathologist examining the arteries on the following scale: normal, no atherosclerosis or only minimal involvement, (1) slight, (2) moderate, (3) severe, and (4) maximal.

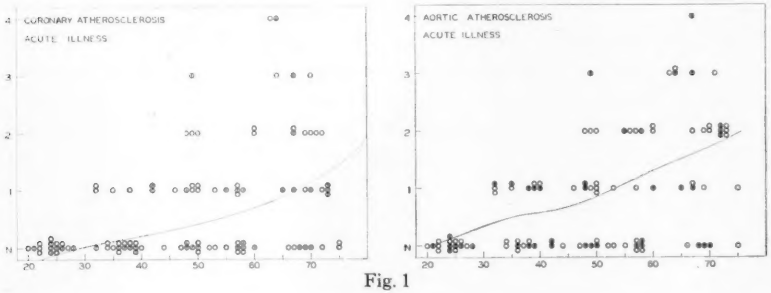

Fig. 1

The raw data on these cases is presented in the scatter diagrams (figures 1 to 7). Each diagram correlates the age of the individual patients to the degree of arterial involvement. Open circles represent male, barred circles, female patients. As the atherosclerosis seemed more severe in the cardiovascular patients of the chronic groups, these were segregated for separate study and are indicated by the solid circles for male, and solid with white bar for female cardiovascular cases.

The group "chronic and sub-acute illnesses, series II" (figure 3) represents an additional series added to the original group as a check upon the validity of the sampling process.

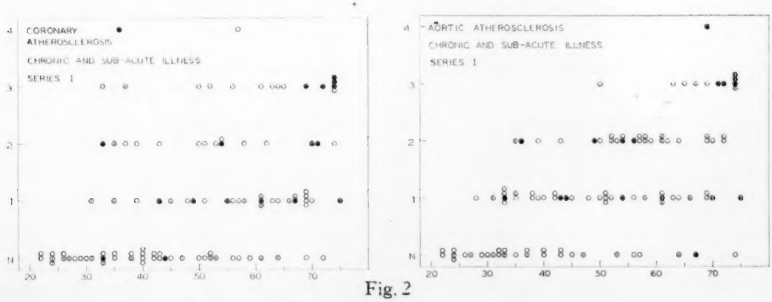

Fig. 2

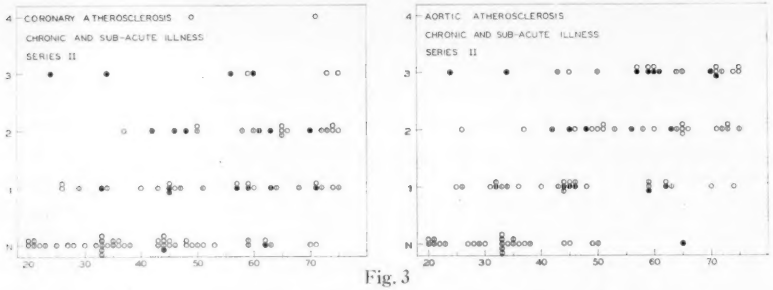

Fig. 3

It is evident from these scatter diagrams that atherosclerosis increases rapidly up to a certain point which is generally age 50 in most of the groups of cases studied (figures 1-7). It is of interest to note that a maximum of

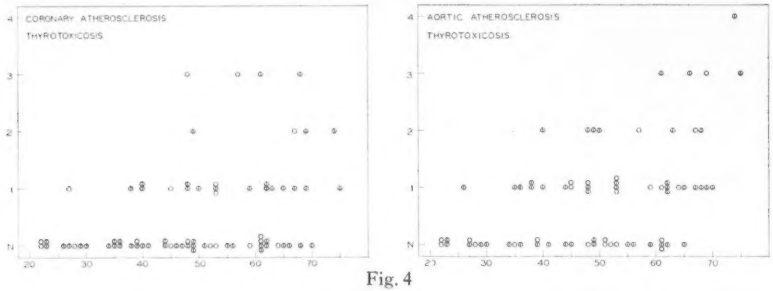

Fig. 4

atherosclerosis of both the coronary arteries and the aorta is achieved by the age of 50 in both males and females for the "acute" and "chronic" control cases (figures 1, 2, 3), also for the malignancy series (figure 5) and

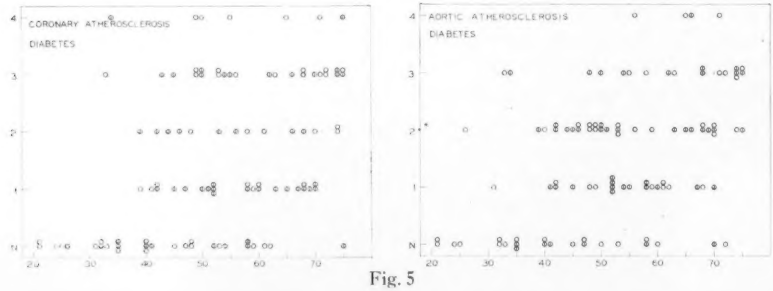

Fig. 5

the thyrotoxicosis series (figure 6). This maximum degree of coronary and aortic atherosclerosis is achieved earlier in the diabetic series (figure 4) and the cirrhosis of the liver series (figure 7), viz., at 40 years of age.

It was of particular interest to find that before the age of 50 in a majority

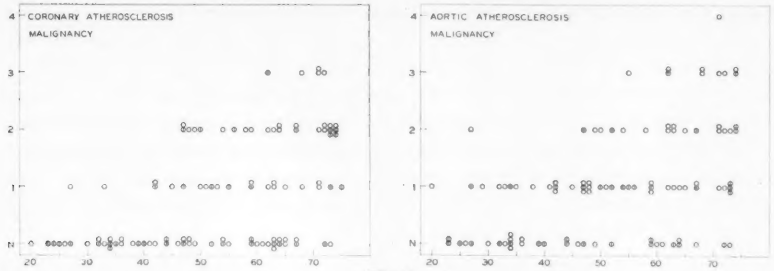

Fig 6

of both control and disease group cases an atherosclerotic lesion of significant magnitude was found in some segment of the left or right coronary arteries. It could be therefore considered that the average individual, beginning at 30 years of age and older, who dies suddenly of accidental or infectious cause (acute controls) has a gross atherosclerotic lesion of the coronary artery. Past the age of 40, this arteriosclerotic lesion of the coronary artery is already of moderate to severe degree.

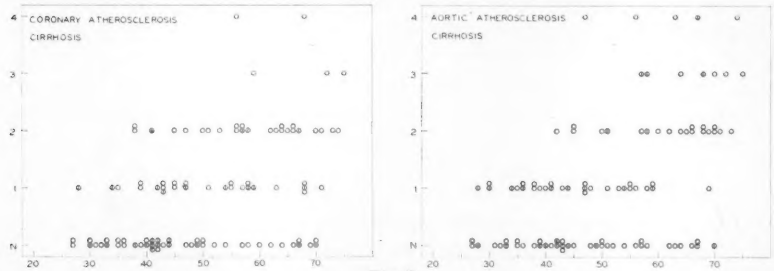

Fig. 7

As the various groups in this study did not represent accurately comparable age distributions, it was necessary to represent mathematically the relationship between age and atherosclerotic level in a hypothetic "control" population of which the "acute" series was presumed to be a sample. In this way the anticipated distribution of atherosclerosis in a "control" group of age distribution exactly equivalent to that of any series we might encounter might be calculated. As Faber's studies on the cholesterol content of the human aorta indicated that the accumulation of cholesterol increased exponentially with age, it was thought that an equation of this form might yield a satisfactory fit with the data in this study. A very satisfactory fit was obtained for the data on coronary atherosclerosis with such an equation, but with the aortic data the best fitting curve had a step-like distortion in the region about 40 to 45 years, with values lying above the "exponential" curve in the region just below this, and below the exponential curve at

slightly higher ages. The curves drawn on the scatter diagrams for the "acute" series represent these "best fitting" curves. The curve for the coronary arteries is the graph of the equation $Y = -1.04 + 0.068X - 0.0012X^2 + 0.00001X^3$ where Y represents the average level of coronary atherosclerosis to be expected at age X. The curve for aortic atherosclerosis is drawn arbitrarily to give the best fit with the data, and its mathematical description has not been attempted. The significance of the "step-like" distortion is open to some question, but is probably real and related to the "step-wise" grading of the arterial lesions.

To subject the data in this study to statistical analysis, it was necessary to assume "anticipated normal" distribution of the various grades of atherosclerosis about the "average" level for any age level. The Poisson equation is applicable in this case, where the cases are distributed into discreet "classes" presumably representing equal increments in the severity of the process being studied. According to Poisson, if the average level of a group is "m" the probability that any one of its members will fall into a given class is given by the terms of the series $e^{-m} + me^{-m} + \frac{m^2}{2\beta}e^{-m} + \frac{m^3}{3\beta}e^{-m}$ where "e" is the base of the natural logarithms.

Accordingly, tables were set up showing the anticipated distribution of the patients into the various classes in hypothetical control groups exactly comparable in age distribution to that of the various other groups in this study, and the actual distribution in the various groups compared thereto. No attempt was made to analyze the effects of sex upon the incidence of arterial atherosclerosis because no marked, consistent trend was observable and the number and distribution of female cases was inadequate to permit statistical treatment.

To determine whether the deviations between the anticipated and observed distributions are significant, Pearson's "chi square" test was applied. Because of the small number of cases at the grade 4 level, and because it was apparent that, as used by the pathologists, grade 4 represented a greater increment over grade 3 than existed between the other grade classes (thereby violating a condition essential for the valid application of Poisson's distribution equation) grades 3 and 4 were grouped together for the purpose of applying the "chi square" test. The figure given under "p" represents the probability that a fit as poor as or poorer than the one observed might be due to errors of random sampling. Thus a probability of 0.05 or less is usually considered as "significant" and 0.01 or less, "highly significant."

Figures 2, 3, 5, show that the chronic and diabetic groups both show highly significant increases in atherosclerosis over that observed in the acute "control" group (figure 1). The increase is somewhat greater in the case of cardiovascular diseases and diabetes than it is for the non-cardiovascular chronic groups, but not enough to assume statistical significance. For aortic atherosclerosis, the thyrotoxicosis group shows less severe involvement and

the malignancy and cirrhosis groups somewhat more severe involvement than the acute controls.

The data for the coronary arteries are qualitatively similar, but the deviation from the controls, although in the same direction, are more pronounced. Here the increases in the cardiovascular and diabetes groups, as compared to the non-cardiovascular chronic series assume definite significance, as do the increases in the malignancy and cirrhosis groups and the decrease in the thyrotoxicosis group when compared to the acute "controls."

DISCUSSION

It is apparent from the data herein presented that the incidence of coronary arteriosclerosis and aortic atherosclerosis is at a maximum in diabetes mellitus. This is in keeping with previously published reports on this subject.[21-30] In contrast the patients who died of chronic thyrotoxicosis revealed the lowest or minimal incidence of coronary arteriosclerosis and aortic atherosclerosis, when compared to the control series and all other groups of cases. Other observers[2, 7, 9] have also reported that atherosclerosis is an uncommon finding in thyrotoxicosis.

The series of "alcoholic" cirrhosis of the liver was studied since certain authors such as Leary[60] have advocated the ingestion of alcohol as an "antidote" against the development of arteriosclerosis. This was proposed on the basis of their belief in the decreased incidence of arteriosclerosis and coronary arteriosclerosis found in patients dying from chronic alcoholism. An experimental study in animals tended to confirm this opinion.[69] Recently Wilens[70] reported a study of the relationship of chronic alcoholism to atherosclerosis. He concluded that the low incidence of atherosclerosis in chronic alcoholism was due to the relatively young age of patients who died from chronic alcoholism and the low incidence of association with diseases such as hypertension, diabetes and obesity. The presence of hypocholesterolemia in "alcoholic" cirrhosis of the liver has been stated by some authors[63, 64, 69] and denied by others.[62] Our data indicate that this type of hepatic cirrhosis is more frequently affected by atherosclerosis than the control series; in fact the increased incidence of atherosclerosis in this disease is similar to that of the series of chronic diseases.

The series of patients who died from cancer of various types was selected for study because of the effect of chronic wasting disease on the reputed lowering of the blood protein and blood lipid levels.[61] Our data reveal no difference in atherosclerosis incidence for the cancer series when compared to the series of "chronic diseases."

The series of cases in the "chronic diseases" category reveals the direct effect of prolonged illness (except thyrotoxicosis) on increasing the incidence of aortic atherosclerosis and coronary arteriosclerosis.

SUMMARY

A series of patients with diseases characterized by hypercholesterolemia and hypocholesterolemia during life was studied in relationship to coro-

nary artery arteriosclerosis and aortic atherosclerosis as found at autopsy.

These cases were compared to "controls" or cases in a series of deaths from sudden, acute illness (medical or surgical) and to a series of patients who died of chronic illnesses other than those of the other groups described herein.

Diseases characterized by hypercholesterolemia are represented as chronic diabetes mellitus. A hypocholesterolemic disease is represented as chronic thyrotoxicosis.

Patients who died of chronic diabetes mellitus, a disease characterized by hypercholesterolemia, revealed an increase in coronary arteriosclerosis and aortic atherosclerosis as compared to a series of "control" patients who died of chronic illnesses and a series of deaths from cancerous illnesses.

Patients who died of chronic thyrotoxicosis, a disease characterized by hypocholesterolemia, revealed a decrease in incidence of coronary arteriosclerosis and aortic atherosclerosis, as compared to the "control" series and all other groups described herein.

Atherosclerotic lesions of the coronary arteries of significant degree are found in persons who die of accidental or acute infectious cause as well as from various chronic diseases, beginning at age 30 and reach a maximum degree at age 50.

It is suggested from these studies that disturbances in cholesterol and lipid metabolism may be etiologic factors in the development of coronary arteriosclerosis and aortic atherosclerosis in human subjects.

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Appreciation is herewith expressed to Kenneth D. Johnson, B.S., for the statistical analyses, and Perla Berlin, B.S., for her assistance.

Surgical Treatment of Prostatism

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AMONG the problems that arise in the older age group, that of prostatic obstruction is of paramount importance. Almost 50 per cent of males after 55 have disease of the prostate, which can be divided into the irritative and the obstructive types. This paper is concerned with the obstructing prostate and particularly with those cases in which the obstruction is severe enough to require surgical correction.

The cases briefly analyzed here were collected as they were admitted to the urological service in the Uniontown Hospital during the years 1942 to 1946 inclusive, forming a total of 228 patients on whom 331 operations were performed. In 1942 there were 32 patients; in 1943, 51; in 1944, 57; in 1945, 36; and in 1946, 52 patients. Eleven of the total were Negroes, a ratio of 1 to 19. At first glance this would seem to indicate that prostatism is infrequent in the Negro race. Figures from the 1940 federal census, however, show that 5.2 per cent of the total population of Fayette County from which these patients were drawn is Negro.

The number of patients in each decade was as follows: 5th, 3; 6th, 28; 7th, 96; 8th, 83; and 9th, 16. Two patients were not included, one 91 and one 19, on whom a resection was done for congenital hypertrophy of the trigone. Of the entire series, 78 per cent of the obstructions occurred between the ages of 60 and 80. This is consistent with the incidence reported by others.

FORTY-ONE patients had symptoms less than one month prior to admission; 72 from one to six months; 28 from six to 12 months; 27 from one to two years; 47 over two years; and in 13 patients this information could not be obtained.

One hundred patients had acute retention on admission; 57 had residual over six ounces; 67 had residual of less than six ounces; and four had no residual urine.

Fifty per cent of the patients had symptoms six months or longer before entering the hospital and many of these came only because of acute retention. This delay in seeking help creates a problem for the physician whose obligation it is to enlighten the public on questions of health. Much education is needed here along preventive lines.

The average hospital stay for the whole group was 30 days. This seems excessive until one considers that the majority were prostatectomized, that 70 per cent of the total had acute retention or a large residual on admission,

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and that a few required extensive hospitalization because they were physically deteriorated from long-standing obstruction. But for these factors, the average hospital stay would have been less than three weeks.

In the resected cases the average period of preparation for surgery was two to five days; for prostatectomies, the average was 11.2 days. This latter figure included the two-stage operation which was reserved for the poor risk cases, the badly infected and patients over 80 years of age. The first-stage cystostomy was usually done within 24 hours of admission.

The mortality, including all deaths irrespective of cause, was:—in 1942, one death, or 3.1 per cent; in 1943, three deaths, or 5.8 per cent; in 1944, five deaths, or 8.8 per cent; in 1945, seven deaths, or 19.4 per cent; in 1946, three deaths, or 5.7 per cent; or a total of 19 deaths, or 8.3 per cent.

THE CAUSES of death of the 19 patients were as follows: broncho pneumonia in four patients; coronary occlusion, in three; pulmonary embolism, in three; diabetic coma and pulmonary embolism, in one; post-operative shock, in one; circulatory failure, in one; pyelonephritis bilateral, in one; embolic pneumonia, in one; post-operative hemorrhage and pyelonephritis, in one; carcinoma of prostate with cachexia and polyneuritis (alcoholic), in one; mitral insufficiency with hemorrhage and infection, in one; and urinary extravasation and peritonitis from spontaneous rupture of vesicle neck, in one.

The complications that occurred during hospitalization were: epididymitis, in 22 patients; cardiac decompensation, in 19; embolism, in 18; pyelonephritis, in 11; post-operative hemorrhage, in seven; thrombophlebitis, in seven; pneumonia, in six; pleurisy, in two; coronary occlusion, in two; rupture of bladder, in two; parotitis, in one; ischio rectal abscess, in one; and wound separation, in one. It is gratifying to note that only one case of wound separation requiring resuturing occurred in the entire series.

These were the types of operations performed: one-stage suprapubic prostatectomies, in 90 patients; two-stage suprapubic prostatectomies, in 57; cystostomies (suprapubic) only, in 20; transurethral resections, in 66; suprapubic lobectomy, in one; and suprapubic transvesical prostatic resection, in one.

THE VARIOUS types of anesthesia used were spinal for 123 patients; Pentothal sodium for 107; Pentothal sodium plus local for 40; local for 32; nitrous oxide plus oxygen for three; and spinal plus Pentothal sodium for one.

The anesthesia was selected as far as possible to fit the individual patient. Spinocain using the Pitkin technic was employed for the first 113 cases. In every case the anesthetic was given by Dr. C. M. Mhley, a member of the general surgical staff, who has had an extensive experience with Spinocain, having used it in all types of cases in his own practice. While the anesthesia was entirely satisfactory, many of the patients showed a rapid drop in systolic pressure during the operative procedure. This at times produced unpleasant

reactions in the older patients and was disconcerting to the surgeon. In the last ten cases procaine was substituted for Spinocain, the dosage depending upon the age, general condition of the patient, and the expected duration of the operation. With this change and judicious use of ephedrine, the systolic pressure was maintained at a more stable level with comfort to the patient and equanimity to the surgeon.

It was found that adequate pre-operative drainage whether by inlying catheter or suprapubic cystostomy reduced to a minimum the bleeding from the prostatic cavity following enucleation. An abdominal sponge or plain packing soaked in hot water was placed firmly in the cavity immediately following removal of the gland and left there five minutes. This controlled the immediate bleeding. The pack was then removed and the cavity inspected for remnants of prostate or ragged edges of capsule. These were removed. In 83 cases a bag was inserted and inflated with water. After 12 hours the bag was deflated and after 48 hours it was removed. The bag was employed in all second-stage enucleations because of the difficulty in visualizing the prostatic cavity through the small fistula. We prefer the Hagner bag introduced in reverse because we believe that anything projecting from the urethra post-operatively encourages infection.

In 92 cases gauze packing was used, inserted hot and adequate in size to fill the cavity left by the enucleation. In the early cases iodoform gauze was employed, but because of the occurrence of reactions from the iodoform, this was discontinued and plain gauze substituted.

In 60 cases, all one-stage prostatectomies, the edge of the capsule was sutured to the bladder mucosa. This was employed where active bleeding could be visualized and definitely reduced blood loss. Plain catgut No. 0 on a short curved needle was used. A continuous suture was inserted from within outward beginning at two o'clock position and continuing to ten o'clock. This reduces the size of the opening at the internal sphincter. It is necessary to test the adequacy of the internal orifice before closing the bladder. In all cases the bladder was drained suprapubically. On the seventh post-operative day the urethra was sounded and a catheter passed into the bladder, which was then irrigated and the suprapubic tube removed. In the last two years, the routine use of gel foam has simplified the problem of hemorrhage from the prostatic cavity. In the case of resections a Foley bag catheter was routine.

A pathological diagnosis of benign prostatic hyperplasia was made in 153 patients; adenoma of the prostate in five; fibroma of the prostate in six; carcinoma of the prostate in 51; chronic fibrosis of the prostate in 14; congenital hypertrophy of trigone in one; and benign prostatic hyperplasia plus carcinoma in three. Carcinoma showed an incidence of 29.2 per cent. Figures for carcinoma in Fayette County have been running consistently high.

Recurrent obstruction was encountered 28 times either following an earlier prostatectomy or an inadequate resection. Bilateral vasaligation was performed 21 times. Bilateral enucleation of testicular substance was performed 14 times. This latter procedure was not done in our clinic prior to 1944 and was, of course, done only in cases of carcinoma.

IN ORDER to arrive at a more accurate mortality percentage the 19 deaths were gone over and divided into three groups. Group I comprising nine cases will be reported in detail because it represents those whose deaths were attributed to the surgical procedure. This reduces the mortality to 3.9 per cent. Group II, comprising three cases, represents patients with advanced prostatic carcinoma in whom treatment was palliative to relieve obstruction. Two of these had extensive metastasis. The seven cases comprising Group III were all in the old age group, prostatics of long standing with arterial degeneration, uremia and infection. Cystostomies only were done on this group, usually on admission.

NECROPSIES FROM GROUP I

Case 3. R. R., age 80. This patient was admitted with suprapubic drainage following cystostomy three months earlier. There was hypertensive cardio-vascular disease of long standing and a large benign hyperplasia of the prostate. Transurethral resection was performed under low spinal anesthesia. Fever developed following the operation and the patient died on the sixth post-operative day from pneumonia. This was too large a gland for resection in our hands. This patient should have remained on permanent suprapubic drainage longer and then been prostatectomized. Diagnosis: Benign hyperplasia.

Case 6. A. M., age 77. Patient admitted with retention of urine of 48 hours' duration with symptoms of increasing obstruction for many months. Examination showed moderate arteriosclerosis with hypertension and a benign hyperplasia. Prostatectomy was performed under spinal anesthesia. Progress was satisfactory until 14th postoperative day when, ready to go home, he developed a pulmonary infarction. A bilateral pneumonia resulted with profound depression, decubitus ulcers and death three months after admission to hospital.

Case 8. L. D., age 82. Admitted in retention with acute obstructive symptoms for one week. Examination showed hypertension and benign prostatic hyperplasia. Four days after admission patient had small pulmonary infarction from which he recovered. After 16 days of preliminary drainage and preparation, prostatectomy was performed under Spinocain. Anesthesia was not adequate so that gas-ether was necessary. Seven days post-operatively patient developed high fever, tachycardia and dyspnea. Death occurred two days later. Diagnosis: Atelectatic pneumonia, 24 days after admission. Death was caused by the infarction from which he never completely recovered and misfortune of having to use multiple anesthetics.

Case 9. E. B., age 81. Patient admitted with large residual, and

history of frequency with acute obstruction of two weeks' duration. Patient was a diabetic whose disease was difficult to control with insulin. Forty-eight hours after admission a transurethral resection was attempted under spinal. A large highly vascular tri-lobed benign hyperplasia was encountered. In spite of the removal of a large amount of tissue the result was not satisfactory, so a second resection was attempted 12 days later. Considerable bleeding was encountered which persisted for 24 hours with moderate post-operative shock. Patient went into diabetic coma on 5th post-operative day and died. Diagnosis: Post-operative shock and diabetes. The two anesthetics and the hemorrhage following the second resection placed too great a strain on this patient..

Case 13. J. S., age 65. Patient first admitted to hospital in February, 1945, with greatly distended bladder detected only by enlargement of abdomen. Examination showed a chronically infected neurogenic bladder, pernicious anemia and uremia. Suprapubic cystostomy was performed under local with immediate improvement. Bladder closed spontaneously, patient left hospital after 45 days much improved with slightly infected residual. Patient readmitted 4 weeks later because of profound weakness, dysuria, severe anemia and large infected residual urine. Catheter drainage and several cystoscopic attempts to lavage kidneys to reduce infection failed. Patient died three months after original admission. Diagnosis: Pernicious anemia with chronic pyelonephritis. Resection should have been performed for relief of obstruction on first admission before discharging patient from the hospital.

Case 15. C. T., age 73. Admitted in acute retention of three days' duration. Obstructive symptoms had come on 8 days previously. Anemia, infection and mild uremia were present on admission. Patient decompressed by catheter 18 days, then resected under Pentothal. Some hematuria followed removal of catheter. Residual which persisted indicated obstruction had not been relieved. Catheter was reinserted, patient transfused and reoperated by prostatectomy under Pentothal. Large benign hyperplasia removed but bleeding continued in spite of packing. Death occurred four days following surgery from hemorrhage and circulatory collapse. Here the prostate was too large for resection in our hands. This patient should have been prostatectomized.

Case 16. G. F., age 78. Admitted from another hospital with urethral catheter drainage of two weeks' duration. Had had acute obstructive symptoms one week. Eight years before had had successful transurethral resection performed. Prostatectomy performed five days after admission under Pentothal local anesthesia. Death was six days post-operative. Autopsy disclosed saddle thrombus in pulmonary vessel and carcinoma of prostate.

Case 17. H. K., age 54. Patient admitted with large residual, with history of obstruction for two years and intermittent catheterization for one month. Transurethral resection performed three days after admission under Spinocain anesthesia. Perivesical abscess formed following resection as result of undermining trigone. Extensive pelvic phlebitis developed with multiple pulmonary emboli and pneumonia. Death occurred two months after admission as a direct result of an accident

occurring at the time of the resection. Pathological report of gland: benign hyperplasia.

Case 19. E. S., age 74. Admitted from another hospital with inlying catheter present two weeks. Had had mild obstructive symptoms 10 years with acute symptoms for one month. Patient was a case of mitral insufficiency who had been on digitalis for some time. Nine days after admission suprapubic cystostomy and electro resection of bar performed under local Pentothal anesthesia. Six days following operation hemorrhage occurred which was controlled by insertion of Foley catheter through urethra and inflation of bag which was pulled into vesical neck. Six days post-operatively patient developed decompensation, cardiac dilatation and died. This was a circulatory death. Surgery, which was followed by hemorrhage, should have been postponed until patient's cardiovascular system was able to tolerate it.

SUMMARY

IN THIS paper the author has analyzed 228 patients on whom 331 operative procedures were performed for prostatic obstruction during a 5-year period. The largest group occupied the 7th decade; 78 per cent of the entire group was found between the ages of 60 and 80.

The average hospitalization for the entire series was 30 days. However, when one considers that 50 per cent of the group had had symptoms of obstruction over six months prior to admission, that 70 per cent were admitted in acute retention or had residual over six ounces, and that resections with an average hospital stay of 7-10 days represents about 20 per cent of the total surgical procedures employed, the long average hospital stay seems less out of line.

Patients treated by operation required an average period of 11.2 days' preparation. Resected patients required two to three days on an average.

The over-all mortality was 8.3 per cent. Causes of morbidity and mortality presented a very interesting and informative study. Epididymitis occurred 22 times or an incidence of 8 per cent. Selecting only those cases, nine in all, whose death was the direct result of the surgery employed reduced the mortality to 3.9 per cent.

Intelligent use of the antibiotics, available during only the last year of this survey, further reduced morbidity and mortality.

The condition on discharge was good in 112, fair in 81 and unsatisfactory in 15. This was based on general recovery, on functional urinary result and presence of infection in urine. In no case has there been a persistent urinary fistula. A few, particularly following resection, have had persistent incontinence.

Ninety one-stage prostatectomies, 57 two-stage prostatectomies, 20 cystostomies only and 66 transurethral resections were performed. Bilateral vasaligation was performed 21 times and bilateral orchiectomy 14 times. This latter procedure was not done prior to 1944.

Spinal anesthesia (predominately Spinocain) was used 123 times; Pentothal sodium 107 times; local (novocaine) 40 times; spinal reinforced with Pentothal once and nitrous oxide-oxygen three times.

Bleeding was controlled in the open operation by the use of a rubber bag or plain packing. In a large number of the cases the capsule was also sutured. The Foley bag catheter was routinely employed following resections.

One hundred fifty-three of the removed glands were benign hyperplasia; five were adenomata; six were fibromata; 51 were carcinomata; 14 were chronic fibroses; three were benign hyperplasia with carcinoma and one was congenital hypertrophy of the trigone. This patient was 19 years of age.

There were 28 instances of recurrent obstruction, some following earlier prostatectomy elsewhere and the remainder the result of inadequate resection by the author.

CONCLUSIONS

Prostatism is becoming a major urological problem, mainly because of the lengthening of the life span. Prostatic surgery should never be the last resort, but should be utilized early when conservative measures have failed to relieve the obstruction. It is hoped that the time will soon come when with the understanding of the cause of this condition prophylaxis and conservatism will replace surgery.

*Varicose Veins in the Aged**

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The general physical condition is the chief factor in determining the type of treatment for patients with varicose veins. A surgical procedure consists of a terminal saphenous ligation with secondary ligations of the incompetent connecting veins. Local anesthesia is used with the patient remaining ambulatory. A urethral catheter is inserted into the distal part of the saphenous vein from the groin incision and a sclerosing solution is distributed throughout the vein, the patient's reactivity to the solution having been tested previously. Secondary incisions are made at sites marked on the leg, toe-to-knee Ace bandages are applied, and the patient is instructed to walk 30 minutes out of every two hours for the first day.

Boric acid ointment with pressure dressings give good results in varicose ulcers and where ulcers are large, healing is hastened by bed rest with the legs elevated. Antibiotics are rarely necessary.

*Treatment of Varicose Veins in the Aged. Annals of Western Medicine and Surgery 4:144, 1950.

Response of Circulating Eosinophiles and Uric Acid Excretion to ACTH in Geriatric Patients*

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THE NUMBER of circulating eosinophiles and the urinary uric acid-creatinine ratio prior to and following administration of adrenocorticotropic pituitary hormone (ACTH) provide a means of evaluating the responsiveness of the human adrenal cortex in various diseases.[1, 2]

Reifenstein et al[3] completed and published studies begun by one of us (F.H.) at the Memorial Hospital, New York, to evaluate adrenal cortical responsiveness in patients with gastric cancer. They compared the eosinophile response, uric acid-creatinine response, and the changes of the potassium- and phosphorus-creatinine ratios provoked by a single injection of ACTH in patients with gastric cancer with those obtained in patients with "diseases that did not involve malignancy or the adrenal cortex." While considerable reductions in the number of circulating eosinophiles were observed in the cancer group as well as in the control group, most of the patients with gastric cancer failed to show significant increases in uric acid excretion. Patients without cancer and without adrenal diseases were found to fall, with few exceptions, within normal limits.

IN THE present study, the ACTH test of adrenal cortical responsiveness was applied to patients with various types of cancer and to control subjects having chronic debilitating diseases. Two dosage levels were used to determine whether the dissociated type of response—drop in eosinophiles and unchanged uric acid excretion—was the result of the higher sensitivity of the eosinophile portion of the test or whether this represented a pattern of response peculiar to patients with gastric cancer or any type of cancer.

Our studies were limited to eosinophile counts, uric acid-creatinine ratios, the sedimentation rate of red blood cells, the total plasma proteins, nonprotein nitrogen, fasting blood sugar, blood uric acid and blood β-glucuronidase before and after the injections.

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This study was aided by grants from the National Institutes of Health, National Cancer Institute, Bethesda, Maryland, from the American Cancer Society, Inc., New York (Institutional Grant) and from the Damon Runyon Fund for Cancer Research, New York.

MATERIAL

THE SUBJECTS of these studies were 14 patients with inoperable cancers, on whom 25 tests were done, and 12 patients without cancer, on whom 21 tests were done. The average age of the cancer group was 63.4, the ages ranging from 33 to 94 years, while in the control group the average age was 71.8 years, with ages ranging from 58 to 87 years. Sex distribution and diagnoses are shown in Table I. Diagnoses of cancer were proven by histological examination of tissue biopsies or post-mortem examination. The patients in both groups were equally malnourished, debilitated and bedridden.

METHODS

Test procedures:

The "short test." Food was withheld from midnight until 1 p.m. the following day, when the test was completed. At 7 a.m. the patient voided and this specimen was discarded. One hundred ml. of water were given every hour from 7 a.m. to and including 11 a.m. At 9 a.m. urine and blood samples were taken and 25 mg. of ACTH were injected intramuscularly. At 1 p.m. urine and blood were again secured.

The "long test." This procedure lasted 48 hours and was begun after the patient had fasted from midnight to 9 a.m. the next morning. The patient voided at 7 a.m. and this specimen was discarded. One hundred ml. of water were then given every hour until 9 a.m., when the first urine and blood specimens were taken. Beginning at 9 a.m., the patient received intramuscular injections of 10 mg. of ACTH every 6 hours for 48 hours—a total of 80 mg. At 9 a.m., 48 hours later, the final blood and urine samples were taken after fasting since the previous midnight, voiding at 7 a.m. and drinking 100 ml. of water at 7 a.m. and 8 a.m.

Laboratory procedures:

To obtain permanent records of the eosinophile response, smears were made from finger blood and the percentage of eosinophiles was determined by counting the number of eosinophiles present in 400 cells examined on a Wright-stained preparation.

Uric acid and creatinine were determined in the urine by the Folin Wu method adapted for the Coleman Jr. spectrophotometer.[4] Wintrobe's method was used to determine the sedimentation rate of red blood cells. Creatinines were measured by the method of O. Folin.[5] Serum β-glucuronidase was determined by the method of Fishman et al.[6]

RESULTS

The data are tabulated as shown in Table I.

Eosinophile response. Accepting the normal range of Thorn et al,[1] all except two patients with cancer showed at least a normal response to stimulation by 25 mg. of ACTH, and all except one of the patients with cancer responded normally to 80 mg. ACTH. In the debilitated patients without cancer, six out of 12 had subnormal drops of the eosinophiles upon injection of 25 mg. ACTH; one of these patients showed no change at all. Only three

out of nine non-cancerous debilitated subjects had a normal decline of circulating eosinophiles when receiving 80 mg. of ACTH.

Uric acid-creatinine ratio. Of 14 patients with cancer who received 25 mg. ACTH, only three showed increases of the uric acid-creatinine ratio of 100 per cent or more. In the others, the changes ranged from a *decrease* by 80 per cent in one patient to increases as high as 65 per cent in others. Of 11 patients with cancer who were given 80 mg. of ACTH, only one showed an increase in the ratio by more than 100 per cent; two showed *decreases* of 75 per cent and 85 per cent, while the remainder varied from no change to increases up to 90 per cent.

Of 12 subjects with non-cancerous chronic disease who were given 25 mg. of ACTH, three had increases of 100 per cent or more, one showed a *decrease* of 48 per cent in the uric acid-creatinine ratio, the others varied from six per cent to 58 per cent, with the majority below 50 per cent. Of nine such patients receiving 80 mg. of ACTH, none showed increases above

TABLE I

					a) Response to 25 mgms. of ACTH in 4 hours			b) Response to 80 mgms. of ACTH in 48 hours		
Hospital No.	Sex	Age	Diagnosis	Lot No.	Eosinophile %Chg	UA/C Urine %Chg	Glucuronidase Serum %Chg	Eosinophile %Chg	UA/C Urine %Chg	Glucuronidase Serum %Chg
CANCER										
1860	M	61	Ca of sigmoid. Diabetes	H4007	-71	45	-23.0	-67	87	-2.35
1858	M	60	Hypernephroma	H4007	-83.5	-78	59.3	-83.3	-90	-8.85
1732	F	66	Chondrosarcoma	H4007	-30	37	5.62	-44.4	22	-29.2
1777	F	33	Ca of cervix	H4007	-71	67	13.9	-51.1	24	36.8
1854	M	64	Ca of lung	H4007	-80	-2	-34.2	-50.0	132	139.8
1847	M	74	Ca of prostate	H4007	-91	186	-1.51	-85.0	90	22.5
1861	F	69	Ca of uterus	H4007	-41.5	203	-13.3	-100.0	-65	-5.05
1800	F	70	Ca of ovary	H4007	-82.5	50	61.9	-25.0	1	-39.0
1717	F	84	Hypernephroma	H4007	-67	20	7.62	-72.7	31	-27.8
1841	M	50	Neurogenic sarcoma —kidney	H4007	-62.5	42	43.1	-100.0	3	—
1865	M	58	Lymphosarcoma	H4007	-100	12	-12.1	—	—	—
1853	F	69	Ca of sigmoid	H4007	-100	2	13.2	—	—	—
1836	F	64	Ca of vulva. Diabetes mellitus	H4007	-77	36	-11.7	—	—	—
1864	F	66	Ca of stomach	H4007	-100	112	-2.0	—	—	—
NON-CANCER										
1631	M	79	Fractured hip	H5409	0	-9	20.8	-60.0	60	12.1
1497	M	58	Diabetes mellitus *CVA, hemiplegia	H5409	-31	10	-13.9	-27.7	80	-3.67
1317	F	68	CVA, hemiplegia	H5409	-72.5	50	-4.5	-50.0	16	4.35
1276	F	79	CVA, hemiplegia	H5409	-44.5	180	-2.35	-50.0	0	.14
1641	F	68	CVA, hemiplegia	H5409	-41.5	58	-2.65	-100.0	-27	37.8
1653	F	65	CVA, hemiplegia	H5409	-69.5	127	-9.15	-100.0	0	31.5
1440	F	78	Paget's disease	H5409	-30	7	-23.8	-37.5	8	3.5
1078	F	73	Diabetes mellitus CVA, hemiplegia	H5409	-56	400	-18.7	-33.3	22	-35.8
1379	F	67	CVA, hemiplegia	H5409	-33.3	-6	6.25	-50.0	-57	10.7
1642	F	81	Fractured hip	H5409	-66.6	0	-21.2	—	—	—
1682	F	87	Fractured hip	H5409	-54.5	-48	5.46	—	—	—
701	M	59	Progressive muscular atrophy	H5409	-72.5	0	15.2	—	—	—

*Cerebral vascular accident

100 per cent. The uric acid-creatinine ratio *decreased* by 27 per cent and 57 per cent in two cases, two showed no change, one an 8 per cent change, and the remaining four had increases of from 16 per cent to 80 per cent.

Fasting blood sugar. In the 43 instances where it was measured, the blood sugar rose in 37 and fell in six of them. The cases showing a drop of the blood sugar levels were two hypernephromas, one lymphosarcoma, one Paget's disease of the bone, one progressive muscular atrophy and one generalized arteriosclerosis with senility. The changes of the blood sugar levels could not be correlated with any type of disease nor with the dosage of ACTH. However, it may be of interest to note that in two diabetics with cancer there occurred the most marked increase in blood sugar (75 per cent and 148 per cent in the "short test" and 171 per cent in the one patient during the "long test"), whereas the increase in two diabetics without cancer was less than the maximal response seen in non-diabetics (27 per cent and 33 per cent in the "short test"; 18 per cent and 32 per cent in the "long test").

Glucuronidase activity of the blood. There was a tendency for the cancer patients to fall more consistently above the 500 unit level than there was in the other group. Out of 48 determinations among cancer patients, 77 per cent fell above the 500 unit level, while 23 per cent fell below. On the other hand, only 57 per cent of the non-cancer group fell above the 500 unit level, while 43 per cent fell below. However, no definite pattern of increase or decrease in values could be found after ACTH stimulation. There was a much greater fluctuation in the values found in the cancer patients in both directions, although what these trends mean cannot be stated at this time.

Sedimentation rate of red blood cells. There were small changes of the sedimentation rate in both directions, with a tendency for the increases to be more pronounced than the decreases, regardless of the group.

Blood uric acid. This did not change significantly in any of the patients receiving 25 mg. of ACTH. In those receiving 80 mg. of ACTH, one patient showed no change, 15 showed drops ranging from six per cent to 27 per cent, and there were increases in three patients by nine per cent to 23 per cent.

Plasma total protein and non-protein nitrogen. These showed insignificant changes.

COMMENTS

It appears from the preceding observations that most of the old people studied who were suffering from debilitating diseases failed to respond to stimulation by ACTH in the fashion observed in younger subjects free from adrenal disease. It was found that many patients might show the "normal" eosinophile drop following administration of ACTH but that only few exhibit a "normal" increase in the uric acid-creatinine ratio. However, all but one patient did show some response, even if it were subnormal. This was not materially altered by an increase of the stimulating dose of ACTH to 80 mg. given over 48 hours. It would, therefore, seem that this modified response of the debilitated represents a different reaction pattern typical for such patients, rather than a higher sensitivity of the eosinophiles to ACTH

as compared with the sensitivity of the mechanisms leading to an increase of uric acid excretion. This is in agreement with work reported by Solomon and Shock.[7] It raises the possibility that the subnormal responses following ACTH in these patients may be due to age and not to disease, because the above workers had used healthy elderly males in their study. The behavior of patients with advanced carcinoma was not different from that of patients with other debilitating diseases, except for the fact that a much greater percentage had a normal eosinophile response.

The observation that the increase in the blood sugar of four diabetics after ACTH was more marked in the presence of cancer needs further study.

It is likewise of interest that changes do occur in the serum β-glucuronidase activity following ACTH and that these are more pronounced in some cases of cancer.

SUMMARY AND CONCLUSIONS

(1) In aged patients with debilitating chronic diseases, the injection of 25 to 80 mg. of adrenocorticotropic pituitary hormore (ACTH) was followed by a response which was different from that in healthy subjects. The number of circulating eosinophiles was diminished in many of these patients, as would be expected in normal subjects. The urinary uric acid-creatinine ratio, however, behaved in many instances as it would in patients with less responsive adrenals.

(2) Equally debilitated subjects with advanced cancer behaved in the same fashion so far as uric acid excretion was concerned but showed a greater change in the number of circulating eosinophiles.

(3) Patients with cancer exhibited a greater lability of serum β-glucuronidase than did patients without cancer.

(4) In isolated cases rises in the fasting blood sugar level following ACTH were more marked in diabetics with cancer than in diabetics without cancer.

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The authors acknowledge the helpful cooperation of Dr. Henry Baker, Chief of Staff, Jewish Memorial Hospital, Roxbury, Massachusetts.

The adrenocorticotropic pituitary hormone was supplied by the Armour Co. in Chicago through Dr. Mote, Medical Director.

A Pediatrician's View of Geriatrics

Irving J. Wolman, M.D.*

THE MORE one tries to contrast pediatrics with geriatrics, the more evident becomes the parallelism between these two disciplines. This does not refer to the superficial similarity between "first childhood" and "second childhood," but rather to the same basic philosophy of each specialty—that of maintaining sound health. Although geriatrics wants to halt overrapid senescence, and pediatrics seeks to foster normal growth, each desires to eradicate all influences detrimental to the orderly march through life. Both specialties aim at keeping the nutritional status of their patients at the optimum level. Both strive for protection against any and all diseases—mostly degenerative among the elderly and chiefly infections in children. Both endeavor to keep their subjects in good mental and emotional balance—geriatrics by cultivating a balanced and curious outlook upon life, pediatrics by shielding the child from environmental and personal difficulties which give rise to behavior problems. If in the mind's eye one bends the arc depicting life so that the segments representing youth and age are parallel, the slopes, though going in opposite directions, will be found similar in contour, and should be kept so.

IT WOULD indeed be presumptuous on the part of one from another division of medicine to expound at length upon the problems of gerontology. The manifestations of aging are too formidable and intricate to be elucidated by a stranger, who could do little except make a second-hand analysis of reports from the journals of the specialty and from the elegant compilations edited by Stieglitz, Cowdry, Thewlis and others. Still it is not amiss for a man like myself to describe several of the major attitudes of modern pediatrics, with the thought that they may prove helpful or stimulating to those more familiar with geriatrics. Pediatrics as an organized science is chronologically older than this nascent specialty, and some of the technics and approaches perfected during its evolution may perhaps prove as fruitful with the geriatricians as it has with us.

Historically speaking, great changes have taken place over the years in the kinds of activities and instrumentalities utilized by pediatrics. When the specialty was first getting under way in this country in the last half of the nineteenth century, under the leadership of Jacobi (who wrote a foreword to the first American text on geriatrics), Abt and the elder Holt, the pediatric domain consisted almost solely of the medical supervision of children with

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peculiar or severe illnesses, refractory to the customary forms of treatment. As did the population at large, the average physician of those days looked upon the prevalence of rickets, diphtheria, gastroenteritis, pneumonia, tuberculosis and the other childhood diseases as insoluble burdens of the human race, no more subject to control than the weather or the flight of birds. The fact that one out of every 6 or 7 liveborn infants succumbed before the first birthday was accepted with fatalistic resignation. Doctors felt that the management of a child with an illness was not very different from that of an adult with the same illness, for surgery and specific therapy were in their rudimentary stages, and watchful nursing was the heaviest weapon in the therapeutic armamentarium. It was not until about 1900 that the infant welfare movement attained sizable proportions and the prevention of unnecessary childhood deaths began to assume the dominant role it holds today. The extent of this achievement is illustrated in Dublin's recent contrasting of death rates for Massachusetts:

TABLE I

DEATH RATES PER 100,000 FROM SPECIFIED CAUSES OF DEATH IN MASSACHUSETTS, 1945 AND 1856-65

Cause of Death	1856-65	1945	Per Cent Decline
Infant Mortality per 1,000 Live Births	174.4	31.6	81.9
Typhoid and Paratyphoid Fever	92.5	0.1	99.9
Diphtheria and Croup	86.1	0.3	99.7
Measles	17.1	0.2	98.8
Scarlet Fever	101.3	0.2	99.8
Whooping Cough	23.8	0.5	97.9
Smallpox	11.0	0.0	100.0
Diarrhea and Enteritis	166.0	4.3	97.4

The improvement in child health which has taken place within the past half-century cannot be credited to any single specialty of medicine, or even to medical progress alone, but no one will deny that one major cause of improvement has been the growth and energy of the science of pediatrics, and the influence exerted by pediatric teaching upon the rest of the community.

The preventive side of pediatrics has grown increasingly prominent with the passage of the years. A fact-finding analysis of the facilities for child care and the character of pediatric practice and education in the United States was recently completed by the American Academy of Pediatrics. Fifty-four per cent of the pediatrician's visits on an average day were found to be devoted to health supervision, only 43 per cent to the care of sick children, the remaining three per cent to persons 15 years of age or older. This high percentage of well-child visits may be taken as an index of the importance which both the public and the pediatricians place upon preventive supervision and care.

In contrast, to quote directly from the report: "General practitioners give less attention to health supervision. Presumably their time is in greater demand for the care of the sick. Of the general practitioner's visits to children (20 per cent of his total practice) less than one in three visits was for health

supervision. Thus while the pediatrician saw an average of nine children a day for health supervision, the general practitioner averaged 1.3. Nevertheless, it is the general practitioner who gave most of the health supervision for the nation's children, for they outnumbered the pediatricians about 20 to one. In isolated areas health supervision in private practice was almost entirely carried out by general practitioners since there were few, if any, pediatricians to help share the load." General practitioners account for 75 per cent of all children's visits to physicians, in comparison with 11 per cent to pediatricians and 14 per cent to other specialists.

Considerable room for better pediatrics still remains. Despite the fact that they are responsible for the care of three-fourths of the children, the general practitioners of this country as a group were found to be far from adequately trained in the medical management of children.

The pediatrics of today will be found to have expanded far beyond the staple considerations of diagnosis and therapy. Much attention is being given to sanitation, to physiology and chemistry of body cells and fluids, to antenatal care, to metabolism, food and nutrition, to epidemiology and immunology, and to psychology and psychiatry. Constant watch is kept on progress in the basic sciences for data and principles which may be of significance to child care.

With this discussion as background, let us survey in some detail the so-called health or well-child examination. This type of visit, you will recall, accounts for 54 per cent of all visits to the pediatrician's office. What happens when a presumably well child is brought in for a periodic checkup? The first several minutes of the interview are spent in inquiries regarding health and habits since the preceding visit, and the nature of any complaints. Posture, nutritional status and general appearance are then noted, along with a thorough physical examination in the search for signs of something wrong. Once a year the urine and the blood picture are tested for possible disturbances. A hemoglobin level a few grams below ideal for the age suggests either poor nutrition or some chronic disease. The matter of immunizations also receives discussion. The physician usually makes a few recommendations about feeding, training and emotional behavior, and refers the child to other specialists if deemed necessary. The last bit of business is arranging for a return appointment. The American Academy of Pediatrics has a printed schedule which gives the frequency with which regular "health" visits should be made to the physician's office. This schedule, coming from an authoritative body of experts, can be shown to the parent if needful.

Parenthetically, one wonders whether the absence of anxious tension which goes with this gratifying kind of practice may be related to the fact that coronary sclerosis and sudden early death are less common among pediatricians than in nearly every other specialty.

Needless to say, a periodic examination of an older patient would be much different in content, and probably much more time-consuming if performed with equivalent thoroughness.

All physicians would agree that the habit of regular health examinations ought to be carried over from infancy and early childhood into adult life. The frequency and rate of many chronic disturbances could undoubtedly be reduced were every adult in our population to report for health examinations at regular intervals, provided of course that there were sufficient medical personnel available. The point cannot be emphasized too strongly. The fact that this policy has been made to work in pediatrics is a sign that it can be attained with older age groups as well. Much public and professional education will be required, of course. One device which has proved its worth in pediatrics is the recording of all the major phenomena associated with health and growth of the child, in a permanent "health record." The American Academy of Pediatrics prints such a book for use by its membership. This health record has spaces for the various feedings during the first year of life, the injections, the teething, the illnesses, the grades at school, the laboratory and psychologic tests, the findings at successive health examinations, the height and weight curves, etc. The record is usually kept in the pediatrician's office, to be turned over to the family if they change doctors or move to another city, or given to the youngster himself when he grows beyond adolescence.

Would it not be sensible to prepare and keep supplementary books for the successive phases of adult life? Consider how helpful it would be to the internist, if, on seeing a new patient for the first time, the patient were to produce a full record of preceding illnesses and normal and abnormal bodily findings, going all the way back to the day of birth. Looking forward a few centuries, wouldn't it be most valuable to collect eugenic records over many generations the way the veterinarians can do with their shorter-lived animal patients?

PURSUING this idea further, the pediatricians would be glad to entertain suggestions for the improvement of their Child Health Record. Provision could readily be made for the gathering of data which might be of medical significance in later years, even though of only questionable practical import in the childhood period. It would not be difficult to procure information over the growing years for such physiologic characteristics as blood pressure, pulse rate, serum cholesterol, serum uric acid, fasting blood sugar level, and related stress-indexes of body functioning. Objective data on the character of the child's emotional responses might also have long-range pertinence.

Geriatrics could be of great service to pediatrics by passing judgment on our current conceptions of the best way to rear children. To take the physical side first, one of the cardinal objectives of our time is to keep all children in optimum health. The definition of optimum health is not easy to arrive at, but implies, in general, freedom from disease combined with top nutrition and emotional equilibrium. If a child seems unusually thin or weak in comparison with his classmates, or if the level of some measurable blood component such as ascorbic acid, hemoglobin or total protein is unusually low,

or if his reactions within the home are asocial or negative, corrective measures are ordinarily advised in order to bring the discordant finding into line with those of the child's healthy fellows. The fact that children of foreign-born parents are taller than their parents at corresponding ages is taken rather universally to mean that these children are in better state, nutritionally, than their parents were.

THE QUESTION raised here is whether this concept is the best for the long run. It is conceivable that our current notions may be conducive to the early onset of senility or to the fostering of certain of the degenerative diseases. Would the feeding of a somewhat different diet to our children, or permitting them to have some of the diseases against which we now protect them, lead to a longer and healthier life span? With less protein than the latest recommended allowance of 3.5 grams per kilogram per day for infants, or less calcium or riboflavin or niacin or milk, would the prospect for escaping cardiovascular-renal disease or atrophic arthritis be better or worse? Is the persistent excretion of an acid urine a condition of physiologic strain? Does tonsillectomy in childhood have any bearing upon subsequent hypertension or arteriosclerosis? Would longevity be increased and senescence delayed if the total caloric intake or input of some of the vitamins were restricted, as has been shown to be true in rats? Should we therefore try to restrict the food intake of the child who "eats like a horse"? Does the finding that an infant on breast milk receives about half as much protein as the infant on cow's milk bear any relation to his subsequent health in middle or old age? As for the mental side, what is the ultimate influence upon character and psychiatric well-being of our present theories of child guidance? Are certain patterns of childhood behavior the harbingers of adult difficulties? Is the time of weaning related to adult insecurity? Does absence of childhood discipline favor the development of maladjustments later on?

PROBLEMS such as these demand solution; they make a great challenge to the oncoming generation. It would be a step forward for organized pediatrics to come together with organized groups of specialists who deal with the older age levels, and work out together a coordinated program which by the follow-up method could evaluate the significance of many of the current pediatric practices. Possibly one modus operandi in such a program would be the gathering of a series of accurate health records, starting with individuals of a very young age, and continued by successive waves of physicians until the span of life were over.

Pediatrics and geriatrics are both part of general medicine. Both specialties ought to work hand in hand with general medicine, perhaps even more closely than in the past, though still retaining their separate identities and functions. In this connection we may mention that were it not for the advances made by pediatrics, geriatrics would have fewer patients to take care of.

The statement is often heard that little need exists for a distinct specialty devoted to old age. The medical problems which arise among the elderly, we are told, are almost identical with those of younger adults. Analogy suggests that this is not true, for a striking similarity exists between the contemporary paucity of knowledge concerning the pathogenesis of such degenerative diseases as arthritis, arteriosclerosis and malignancy, and the lack of knowledge 75 years ago concerning the pediatric disorders of malnutrition, gastroenteritis and the acute contagions. The disturbances of senescence which baffle geriatrics today are as obscure in their origins as were the infectional and nutritional diseases of the nineteenth century.

Note may be taken of the extremely live interest which life insurance companies have in child health. For these business organizations the prolongation of life is an intensely practical matter. As one means toward their objective they place a great deal of emphasis upon health and welfare of children.

Geriatrics seems to be in need of more facts and principles with respect to the pathogenesis of the aging process. Early pediatrics matured to its present flowering by drawing heavily upon expanding knowledge in biochemistry, physiology, nutrition, bacteriology, immunology, epidemiology, growth and development, psychiatry and all other ancillary sciences. One cannot but commend the farsightedness which motivates an organization such as the American Geriatric Society. Its members are very wise to encourage investigations in the physiology and pathology of senescence, while at the same time training a body of interested physicians in the methods of transferring to the immediate care of patients the most promising experimental observations.

*Cardiac Rupture During Rehabilitation**

T. H. Howell, M.R.C.P., *and A. P. Piggot*, M.R.C.S.

Efforts to rehabilitate hemiplegic cases must be undertaken with the realization that if too much strain is put on the abnormal heart or vessels of such subjects, catastrophes may ensue.

Trevor H. Howell, M.R.C.P., and A.P. Piggot, M.R.C.S., report a case in which rehabilitation was begun on a 74 year old female hemiplegic two months after admission to hospital. After one month the patient could raise herself to a standing position and also raise the hemiplegic leg. However, the first time walking was attempted the patient collapsed and died.

On postmortem examination the right ventricle of the heart showed a rupture one inch long and ½ inch deep. The wall of the right ventricle had very thin muscle, being mostly composed of fat in several places.

*The British Journal of Physical Medicine, 12:151-152, Nov.-Dec., 1949.

A Statistical Analysis of Rehabilitation in Hemiplegia*

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DURING THE two-and-one-half years ending January 1, 1949, a total of one hundred and five hemiplegic patients were treated on the Rehabilitation Service of the Minneapolis Veterans Administration Hospital. The statistical analysis reported in this paper deals with the results of a retraining program involving all of these patients, though this report is based upon the training results of only eighty-two of the patients. These were taken from the total of one hundred and five after removing the records of those patients who died, those who remained for an insufficient length of time, those who were capable of 85 to 100 per cent of normal activity on admission, and six on whom data were inadequate.

Experience at this hospital has given rise to the following type of rehabilitation program for the treatment of hemiplegic patients. First, a complete evaluation of the patient is made, including medical, neurological and psychological examinations and social and vocational studies. On the basis of this total evaluation a goal is set and a coordinated program of therapy is instituted. The coordination of the therapeutic program is the task of the physician, who supervises the physical therapy, corrective therapy, medical care, and social and vocational adjustment of the patient as he continues in the various retraining and readjustment aspects of the rehabilitation program. The present paper deals with a statistical analysis made to gauge the effectiveness of the retraining efforts of the rehabilitation staff.

PROCEDURE

AMONG THE patients concerned in the training program, the following complicating conditions were found: cardiac disease in 20 patients, multiple cerebral thromboses in 11, diabetes in seven, convulsions in six, amputations in two, renal impairment in one, carcinoma of the prostate in one, and fibrosarcoma of the back in one.

The following pathological conditions contributed to the etiology of the hemiplegia: arteriosclerosis in 82 patients, vascular anomaly (aneurysm) in 11, embolus in six, brain tumor in five, trauma in three, meningovascular syphilis in three, arteritis in two, polycythemia in one, and multiple sclerosis in one.

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In the evaluation of the progress of the patient's rehabilitation the following scoring variables were used:

General improvement. This score represents a rating of the patient's over-all progress relative to that which was expected in view of his condition upon entering rehabilitation. This score varies from zero to three: zero indicates relative failure, and three denotes maximum relative over-all improvement.

Ambulation. This is an objective measure of the patient's ability to walk. Zero denotes inability to walk, three denotes very satisfactory hemiplegic gait, and the variation is, again, from zero to three.

Self-care. This variable is an objective measurement of the patient's ability to care for his person and personal belongings. Zero denotes lack of ability to care for himself at all, while three denotes the maximum score possible to obtain in this function. Intermediate ratings are one and two.

Length of rehabilitation. This is simply the total period of rehabilitation training expressed in months.

Duration of disability. This is also expressed in months and indicates the length of time that the patient was disabled previous to entrance upon the rehabilitation program.

In the case of the *Ambulation* score and the *Self-care* score, an "improvement" score also is reported for each of these two variables; e.g., the difference between the patient's initial ambulation score and his final ambulation score (at the close of training) is his "Ambulation Improvement Score."

The statistics used in this paper are: (1) the mean, the arithmetical average, and (2) the standard deviation, the measure of group variability. The tests which were used in evaluating the significance of the differences between means and standard deviations were, respectively, the critical ratio and the "F" test (variance ratio test).

In the course of analyzing the rehabilitation training results, it was found desirable to make the following breakdowns of the patient group: (1) those with right hemiplegia and those with left hemiplegia, (2) those with a disability of less than three months duration and those with disability of three months or more, (3) those 55 years of age and younger and those more than 55 years of age. The tables that follow list the results according to the above three breakdowns. With the exception of Table I, all the tables are set up for the comparison of the two groups represented in the particular breakdown. The mean, or average, of one group may be compared with that of the other group in the breakdown on the scoring variables described above. Where the difference between the two averages is large enough to be statistically significant, this is indicated on the table. Such a difference is one which is too large to be considered the result of mere chance differences due to sampling errors. Thus, such a difference may be considered "real" rather than "chance" and would be expected to occur each time a similar group of cases was studied.

TABLE I

DESCRIPTIVE DATA FOR 82 HEMIPLEGIC PATIENTS

Variable	Mean	Standard Deviation
Age	54.39	11.38
General improvement	2.38	.96
Ambulation improvement	2.32	1.40
Self-care improvement	1.82	1.20
Length of rehabilitation (months)	3.82	3.40
Duration of disability (months)	10.61	17.27

RESULTS

Table I gives descriptive information regarding the total group of eighty-two patients: the average age is shown together with the mean scores for the group on the scoring variables described in the previous section. A measure of the variability is also shown for each descriptive category.

TABLE II

THE CONDITION OF PATIENTS COMPARED ACCORDING TO THE DURATION OF DISABILITY

Variable	Less Than Three Months (N:38) Mean	S. D.	Three Months and Over (N:39) Mean	S. D.
General improvement	2.46	.86	2.45	.91
Ambulation improvement	2.84	1.08	2.05	1.45*
Self-care improvement	2.22	1.14	1.58	1.09*
Original ambulation	.59	.91	1.29	1.47*
Original self-care	1.08	1.10	1.76	1.71*
Length of rehabilitation (months)	3.91	2.88	3.89	4.11

*The differences between these means are significant statistically at the three per cent level.

†The difference between these standard deviations is significant at the five per cent level.

TABLE II gives the means and standard deviations on each scoring variable when the total group is divided into two groups according to duration of disability: (1) 38 patients whose disability before entrance into the Rehabilitation Service had lasted less than three months; (2) 39 patients whose disability had lasted three months or more. It is to be noted that ambulation improvement and self-care improvement are both significantly better for the patients in the first group; however, the scores for original ambulation and for original self-care were higher in the second group of patients. The latter difference can be presumed to account for, in large part, the greater measure of improvement in the first group: this group had their disability for a shorter length of time, had recovered less than the other group and consequently had farther to go to reach maximum improvement. An interesting point in this connection is that there is no significant difference between the mean length of rehabilitation for the "less than three months" group and that for the "three months and over" group. This could be due to the fact that although the latter group had initially achieved more ambulation and self-care skills than the first group, some of the self-taught skills were faulty and had to be unlearned resulting in an equal length of rehabilitation for the two groups.

IN THE breakdown as to duration of disability, it should be noted that the variability (as measured by the standard deviation) is not significantly different between the two groups on any of the variables except length of rehabilitation. Here the "three months and over" group is more variable. This greater variability is probably due to the fact that individual differences play a greater role in learning in the patients who had spent more of their learning period outside of the rehabilitation program. It should perhaps be

added that none of the differences shown in Table II can be supposed to be due to differences in "attitude" since on General Improvement, the only one of the variables which might reflect attitude, the groups do not differ significantly.

The data given in Table II (as in Table III) are not based on the records of the entire group of 82 patients because in a few cases an item of pertinent information was lacking.

TABLE III

THE CONDITION OF PATIENTS COMPARED ACCORDING TO RIGHT AND LEFT HEMIPLEGIAS

Variable	Right Hemiplegia (N:40) Mean	S. D.	Left Hemiplegia (N:39) Mean	S. D.
General improvement	2.33	.98	2.51	.84
Ambulation improvement	2.05	1.43	2.67	1.37*
Self-care improvement	1.73	1.36	2.00	.99
Original ambulation	1.35	1.48	.87	1.19
Original self-care	1.63	1.41	1.44	1.13
Length of rehabilitation (months)	4.03	4.21	3.62	2.40†

*The differences between these means are statistically significant at the five per cent level.

†The differences between these standard deviations are significant at the one per cent level.

TABLE III presents means and standard deviations on the scoring variables when the group is broken down into patients with right hemiplegia and patients with left hemiplegia. Inspection of the table shows that the patients with left hemiplegia had a greater mean ambulation improvement than did those with right hemiplegia. This may be due in part to the fact that in the left hemiplegia group the original ambulation score tended to be lower than that for the other group (though the difference is not statistically significant). However, probably more important is the fact that in the right hemiplegia patients (where the cerebral lesion is in the dominant or major hemisphere and may involve the speech centers) there may be communication difficulties. It may also be important that in the right hemiplegics the involvement is on the originally preferred side of the body.

The only other significant difference between the right and left hemiplegics is that between the standard deviations of the two groups on the length of rehabilitation variable. The right hemiplegics are seen to be a more variable group. This may be another result of the fact, mentioned previously, that in some of the right hemiplegics there are speech and other difficulties with the result that the rehabilitation period may be extended.

One statistically significant difference between the two age groups as shown in Table IV is that between the standard deviations on the variable length of rehabilitation. The older age group is more variable. This may reflect a greater variability among the older patients in attitude toward returning home; some of these patients had homes to return to, while others did not. In the younger group, on the other hand, the attitude was more uniformly a strong desire to return home. The mean general improvement score is also significantly higher in the younger group. This again may

reflect a lower drive to succeed in the older group, i.e., the level of aspiration is lower in this group than it is in the younger group.

TABLE IV

CONDITION OF HEMIPLEGIC PATIENTS COMPARED ACCORDING TO AGE GROUPS

Variable	Fifty-five Years and Under (N:43) Mean	S. D.	Over Fifty-five Years (N:39) Mean	S. D.
General improvement	2.58	.78	2.15	1.07*
Ambulation improvement	2.35	1.36	2.38	1.33
Self-care improvement	1.77	1.25	1.87	1.14
Length of rehabilitation (months)	3.42	2.21	4.24	4.31†

*The differences between these means are statistically significant at the five per cent level.

†The differences between these standard deviations are significant at the one per cent level.

In general, the results just described indicate that greater efficiency in retraining is achieved when the patient is placed on a rehabilitation program as soon as possible after the disability is incurred. Also, the results suggest that the younger the patient is when placed on rehabilitation the better will be his success in re-education. This seems to be due mainly to greater incentive to achieve in younger individuals. This incentive seems to decline progressively with increase in age. Morale is definitely of major importance in determining the length of the rehabilitation period needed as well as in deciding its ultimate degree of success.

SUMMARY

A STATISTICAL analysis of the results of a rehabilitation training program involving 82 hemiplegic patients has been presented. The etiology of the hemiplegia and the complicating conditions existing among the patients studied were described.

Results suggest that the age, morale, and duration of the disability are factors of major importance contributing to the length and success of the rehabilitation program. Also, patients with right hemiplegia tended to have lower ambulation improvement scores and were more variable as to length of time spent on the rehabilitation service.

Still, the later years of life, and even old age itself, are not without their intellectual compensation. It is only then that a man can be said to be really rich in experience or in learning; he has then had time and opportunity enough to enable him to see and think over life from all its sides; he has been able to compare one thing with another and to discover points of contact and connecting links, so that only then all the true relations of things rightly understood . . . "

SCHOPENHAUER, *Councils and Maxims*

Psychic Trauma Associated with Colostomy

Bernard J. Ficarra, M.D.*

With the rise of specialization, doctors have concerned themselves only with their own duties in the vast field of medicine, in many instances losing sight of the patient as a psychosomatic entity. A surgeon may perform an operation which is necessary for the preservation of life, but which may cause psychic trauma of sufficient severity to alter the social pattern of the individual concerned. This is especially true in the management of patients upon whom a colostomy has been performed for some pathologic condition of the lower colon or rectum.

The patient who awakens from an operation to find himself having bowel movements through an opening on the abdomen has valid cause for consternation. A normal bowel habit has a salubrious effect on elderly patients as a normal expression of a healthful physiology of the gastrointestinal tract. The sudden loss of a frequently used physiologic process must of necessity give rise to disturbing reflections. Unfortunately, colostomy patients rarely fall under the care of psychiatrists for guidance. As surgical problems, these persons continue to be seen and treated by the surgeon. If the surgeon is short-sighted he will see only that part of his patient under consideration. The wiser surgeon, however, finds that simple, friendly conversation will bring to light the mental trauma produced when a colostomy is performed upon the geriatric patient. Discovery of this trauma will enable the surgeon to adopt measures for combating this disquietude.

Rarely is a patient informed preoperatively that he is to have a colostomy. He becomes aware of this situation only after the operation has been performed. During the immediate postoperative period, there is no unusual psychic trauma—only that associated with any operation—but on the third or fourth postoperative day he becomes somewhat alarmed and informs the doctors and nurses that his bowels have not moved. About this same time his colostomy begins to function and he is confronted with the fact that his feces are evacuated through the abdominal wall.

Disturbing thoughts rush through his mind, somewhat in this order of frequency: "How can I bear this situation?" "How will I take care of this mess?" "I am no good any more. I'm licked." "Wait until my husband (or wife) finds out." "How will I face my friends?" "I don't want to see anyone." "I won't be able to go anywhere." "Maybe I have cancer and I'll die." "Will I have this thing forever?" "What happened to my rectum?"

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These distressing questions find external expression in the patient's disinterest in his own physical health. An apathy toward getting well supersedes the preoperative anxiety for correction of his illness. As the questions arise they must be discussed intelligently with the patient. Often the surgeon has to approach the subject and bring to light that which the patient is timid to discuss. It is preferable for the doctor to begin the conversation which will reveal the psychic trauma he has unwittingly produced. The surgeon who walks into the postoperative room to examine the wound or to change a dressing, and then walks out, is remiss in his duty to the colostomy patient.

These aforementioned problems fall into three main categories: the first concerned with the individual and his colostomy; the second with the patient and his family; the third with the patient and his friends or social group.

In the first group the most frequently encountered thought is, "How can I bear this situation?" The patient may refuse to look at a colostomy. Many will pull their pajamas over their face or cover their eyes with a towel or their hands. When the abdomen is finally seen, the patient is filled with disgust and remarks, "How will I take care of this mess?" There is an associated fear of defeat and the patient commences to think he is "finished." One of my patients continued to mumble to me over and over again, "I am no good anymore. I'm licked; I'll never be able to work again." He senses that he will be a burden to those about him and with this realization the thought of cancer arises. Several patients have said that they believed a colostomy indicated the terminal stages of cancer. With this thought the hope for death during the postoperative period of hospitalization is not uncommon. As time passes and the initial shock of a colostomy is lessened, the patient regains his equilibrium and asks, "Will I have this forever?"—The answer, of course, depends upon whether the colostomy is temporary or permanent. As he becomes ambulatory he realizes that he has lost the defecation reflex and asks the doctor, "What happened to my rectum?" He is conscious of his rectum because most disease processes for which a colostomy is performed produce either constipation or diarrhea and his attention preoperatively was focused on bowel function.

As the time approaches for the patient to go home, another bombardment of psychic trauma occurs. Such things as a colostomy are expected in a hospital and all facilities for caring for it are available, but homes are not properly equipped. "What will my family, especially my wife, think of this situation?" "How shall we live with it?" "Maybe they will all shun me." Thought is given to marital obligations. Patients have asked, "What will happen to my sex life?" It is true that in many instances the operative procedure destroys nerves which play a part in the sex cycle. Loss of libido, impotency, and absence of an ejaculatory reflex are common. To adjust the patient to this new loss (especially in the young) the aid of a competent psychiatrist may be needed.

After the patient has passed through these two stages of mental conflict and is just about adjusted to his familial surroundings, the third category of questions centering about his social life presents itself. He is in danger at this stage of developing an anti-social complex and often refuses to see his former friends and acquaintances. The reason for this is that he believes he may have what patients call an "accident," or inability to control bowel evacuations when least expected. A fecal odor may persist about the patient, flatus may be passed, frequently with embarrassing noises. Under these circumstances the patient dissuades himself from visiting his friends and relatives, and confines his entire activities to the home. When friends volunteer to visit the home, they are met with objections, procrastination, and postponements of visits.

THIS IS the series of mental processes which confront the surgical patient following a colostomy. The interest, care and consideration of the attending surgeon will alleviate the mental trauma and assist such persons to regain sufficient confidence to again fit into their proper social pattern. Some doctors, aware of their patients' problems, insist that they follow a preformed postoperative regimen.

COLOSTOMY REGIMEN

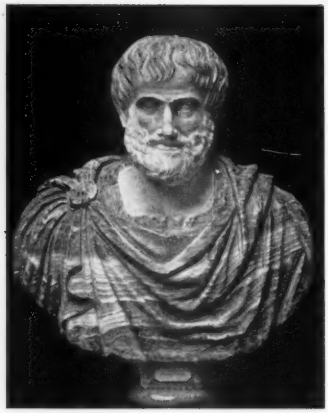
During the immediate postoperative period the patient is given a booklet entitled, "Instructions for Colostomy Patients," whose initial paragraph introduces him to the need of a colostomy. This booklet teaches the patient how to control the colostomy, how to irrigate and care for it in order to eliminate offensive odors, and gives directions for a regulating diet.

The patient is encouraged to return to his former activities, occupation, and way of life. The use of the colostomy bag is abandoned, and new appliances are employed which eliminate odors, do not bulge and are quite invisible.

CONCLUSIONS

When a colostomy is to be temporary the mental anguish is not a serious problem. The patient is assured that it will be eliminated and that his bowel habits will return to normal. In selected cases the modern surgeon is able to perform radical procedures which eliminate a colostomy in those diseases where formerly it was considered inevitable.

In those instances where a colostomy must be performed, however, the surgeon should consider both the mental and the physical aspects. The surgeon of today should not be a mere technician, but on many occasions he must be the patient's counselor and comforter. This is especially true in colostomy patients. Proper understanding, encouragement and guidance will assist such patients to return to their former activities with regained courage and renewed confidence.



Aristotle's Observations on Gerontology

*John J. Griffin**

ARISTOTLE, reputedly the greatest of all the ancient philosophers, was a doctor's son. The fact that the profession of medicine was long hereditary in his family[1] probably explains his remarkable interest in both the physiological and the psychological processes of aging.

Aristotle was born in 384 B.C. in Stagira, a seaport town of Macedonia. His father, Nicomachus, was court physician to King Amyntas II, father of Philip the Great. His early study of biology was undoubtedly accompanied by training in dissection and it is quite possible that he even practiced medicine. At the age of seventeen he went to Athens where he studied for twenty years under Plato. After the death of the older philosopher, he spent some five years in Asia Minor, where an appreciable part of this time was consumed in research on biological specimens as evidenced by his data about the fish and animals of the region. He married; for two or three years (343-340 B.C.) tutored Alexander, the future world conqueror; returned to Athens about 335 B.C.; and until his death in 322 B.C. devoted his energies to the conduct of his famous lyceum, to advances in investigation and speculation, and to the composition of his philosophical treatises and scientific essays.

Aristotle's references to aging are dispersed throughout his multifarious works and it is only by examining all his dissertations that we are able to cull the most rewarding excerpts. While we find suggestive statements in the more scientific portions of his studies, we discover the richest sources in his books on political science, on ethics and quite surprisingly, on rhetoric.

An observation, perhaps of primary significance, is Aristotle's declaration of the differentiation in the life span of biological species. In his volume *On Generation and Corruption,* the Stagirite says: " . . . the times (i.e., *the lives*) of the several kinds of living things have a number by which they are distinguished; for there is an Order controlling all things, and every time (i.e., *every life*) is measured by a period. Not all of them, however, are measured by the same period, but some by a smaller and others by a greater one; for to some of them the period, which is their measure, is a year, while to some it is longer and to others shorter."[2] Not only is this thinker alert to the varying longevity of living things, but he is notably sensitive to the divers phenomena of aging in humans. In his disquisition *On the Generation of Animals,* after proving that semen is not a waste product as some of his predecessors thought, but a secretion representing "the ultimate gain drawn from nutriment," Aristotle, speaking of men, comments pointedly: "More-

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over, semen does not exist in them either in childhood or in old age or in sickness—in the last case because of weakness, in old age because they do not sufficiently concoct their food, and in childhood because they are growing and so all the nutriment is used up too soon, for in about five years, in the case of human beings at any rate, the body seems to gain half the height that is gained in all the rest of life."[3]

Like his teacher, Plato, in the *Republic,* Aristotle in his *Politics* delineated his concept of the ideal state. In the course of his description he reflects on the meaning of age in respect to virtually every aspect of life.

In Aristotle's *Utopia,* for instance, marriages would not be haphazard. Conjugal union was to be planned so that parents would not be too young at the time of procreating, or too old when their children reached their majority. In his estimation there is an upper limit as well as a lower to the procreative years. "Having determined at what ages men and women are to begin their union," he premises, "let us also determine how long they shall continue to beget and bear offspring for the state." "Men who are too old," he opines, "like men who are too young, produce children who are defective in body and mind; the children of very old men are weakly. The limit, then, should be the age which is the prime of their intelligence, and this in most persons, according to the notion of some poets who measure life by periods of seven years, is about fifty; at four or five years later, they should cease from having families; and from that time forward only cohabit with one another for the sake of health; or for some similar reason."[4]

In Aristotle's perfect state, of course, the powers of government were to be reserved to the senior citizens. Governing is the natural prerogative of the elderly, in his system of political science. "Nature herself," he assures us, "has provided the distinction when she made a difference between old and young within the same species, of whom she fitted the one to govern and the other to be governed. No one takes offense at being governed when he is young, nor does he think himself better than his governors, especially if he will enjoy the same privilege when he reaches the required age."[5]

The military vocation is for strong youths, statecraft for wise old men, Aristotle insists. "There is in a state a class of warriors, and another of councillors, . . . both functions should be entrusted by the ideal constitution to the same persons, not, however, at the same time, but in the order prescribed by nature, who has given to young men strength, and to older men wisdom."[6]

The performance of priestly ceremonies should be assigned to both retired warriors and councillors, Aristotle contends. "Now, since the body of the citizens is divided into two classes, the warriors and the councillor, and it is beseeming that the worship of the gods should be duly performed, and also a rest provided in their service for those who from age have given up active life, to the old men of these two classes should be assigned the duties of the priesthood."[7]

Despite his respect for the experience and wisdom of the aged, Aristotle has no illusion that the mere passage of time suffices to make men virtuous. Very candidly he admits that: "The council of elders is not free from defects. It may be said that the elders are good men and well trained in manly virtue; and that therefore, there is an advantage to the state in having them. But, that judges of important causes should hold office for life is a disputable thing, for the mind grows old as well as the body. Many of the elders are well known to have taken bribes and to have been guilty of partiality in public affairs."[8]

In his *Nicomachean Ethics,* Aristotle treats of several aspects of old age. He teaches profound respect for parents and likewise for all those advanced in years. The philosopher does not merely dwell in abstract speculation on

this subject, but descends at times to very practical details. As for example, he states: "It would be thought that in the matters of food we should help our parents before all others, since we owe our own nourishment to them, and it is more honorable to help in this respect the authors of our being even before ourselves; and honour too one should give to one's parents as one does to the gods . . . To all older persons, too, one should give honour appropriate to their age, by rising to receive them and finding seats for them and so on."[9]

The friendship of old people, Aristotle is persuaded, has discernible limitations. His similitude, in fact, is rather uncomplimentary when he compares: "Neither old people nor sour people seem to make friends easily; for there is little that is pleasant in them, and no one can spend his days with one whose company is painful, or not pleasant, since nature seems above all to avoid the painful and to aim at the pleasant."[10]

In fact, Aristotle feels certain that the friendship of the aged is something that does not rise above the level of expediency. "This kind of friendship seems to exist chiefly between old people (for at that age people pursue not the pleasant but the useful) and, of those who are in their prime or young, between those who pursue utility. And such people do not live much with each other either; for sometimes they do not even find each other pleasant; therefore they do not need such companionship unless they are useful to each other; for they are pleasant to each other only in so far as they rouse in each other hopes of something good to come."[11]

That the meaning of age in relation to mental processes is of major concern to the great Peripatetic, is obvious from the psychological portions of his works. Impressive, too, is his profound conviction in the indestructibility and immortality of the mind. "The case of the mind is different; it seems to be an independent substance implanted within the soul and to be incapable of being destroyed. If it could be destroyed at all it would be under the blunting influence of old age. What really happens in respect of mind in old age is, however, exactly parallel to what happens in the case of the sense organs; if the old man could recover the proper kind of eye, he would see just as well as the young man. The incapacity of old age is due to an affection not of the soul but of its vehicle, as occurs in drunkenness or disease. Thus it is in old age that the activity of mind or intellectual apprehension declines only through the decay of some other inward part; mind itself is impassible."[12]

In his opuscula *On Memory and Reminiscence,* he expatiates somewhat on the relation of the condition of the sense organs to memory. His explication of why the very young and the senile fail in retentive memory is suggestive. "The process of movement (sensory stimulation) involved in the act of perception stamps in, as it were, a sort of impression of the percept, just as persons do who make an impression with a seal. This explains why, in those who are strongly moved owing to passion, or time of life, no mnemonic impression is formed; just as no impression would be formed, if the movement of the seal were to impinge on running water; while there are others in whom, owing to the receiving surface being frayed, as happens to (the stucco on) old (chamber) walls, or owing to the hardness of the receiving surface, the requisite impression is not implanted at all. Hence both very young and very old persons are defective in memory; they are in a state of flux, the former because of their growth, the latter owing to their decay."[13]

It is in his tome on *Rhetoric,* that Aristotle gives us his fullest appreciation of character correlative with age. In delightful passages replete with sagacity he outlines the qualities typical of the young, those in their prime, and the aged.

"The character of elderly men—men

who are past their prime—may be said to be formed for the most part of elements that are the contrary of all these. They have lived many years; they have often been taken in and often made mistakes; and life on the whole is a bad business. The result is that they are sure about nothing, and under-do everything. They 'think' but they never 'know'; and because of their hesitation they always add a 'possibly' or a 'perhaps'; putting everything this way and nothing positively. They are cynical; that is, they tend to put the worst construction on everything. Further, their experience makes them distrustful and therefore suspicious of evil. Consequently they neither love warmly nor hate bitterly, but following the hint of bias they love as though they will some day hate and hate as though they will some day love. They are small-minded, because they have been humbled by life; their desires are set upon nothing more exalted or unusual than what will help them to keep alive. They are not generous, because money is one of the things they must have, and at the same time their experience has taught them how hard it is to get and how easy to lose. They are cowardly, and always anticipating danger; unlike that of the young, who are warm-blooded, their temperament is chilly; old age has paved the way for cowardice; fear is, in fact, a form of chill. They love life; and all the more when their last day has come, because the object of all desire is something we have not got, and also because we desire most strongly that which we need most urgently. They are too fond of themselves; this is one form that small-mindedness takes. Because of this, they guide their lives too much by consideration of what is useful and too little by what is noble—for the useful is what is good for oneself, and the noble what is good absolutely. They are not shy, but shameless rather; caring less for what is noble than for what is useful, they feel contempt for what people may think of them. They lack confidence in the future; partly through experience —for most things go wrong, or anyhow turn out worse than one expects; and partly because of their cowardice. They live by memory rather than by hope; for what is left to them of life is but little as compared with the long past; and hope is of the future, memory of the past. This, again, is the cause of their loquacity; they are continually talking of the past, because they enjoy remembering it.

"Their fits of anger are sudden but feeble. Their sensual passions have either altogether gone or have lost their vigour; consequently they do not feel their passions much, and their actions are inspired less by what they do feel than by the love of gain. Hence men at this time of life are often supposed to have a self-controlled character; the fact is that their passions have slackened, and they are slaves to the love of gain. They guide their lives by reasoning more than by moral feeling; reasoning being directed to utility and moral feeling to moral goodness. If they wrong others, they mean to injure them, not to insult them. Old men may feel pity, as well as young men, but not for the same reason. Young men feel it out of kindness; old men out of weakness, imagining that anything that befalls any one else might easily happen to them, which is a thought that excites pity. Hence they are querulous, and not disposed to jesting or laughter —the love of laughter being the very opposite of querulousness."[14]

Aristotle has of course, a very practical reason for indulging in this characterology of age in his book on *Rhetoric*. He is instructing his students to shape their orations with a view to the age-character of their audience. Hence at the end of his discussion, he impresses the remembrance of this psychological attitude: "Such is the character of young men and elderly men. People always think well of speeches adapted to, and reflecting their own character; and we can now see how to compose our speeches so as to adapt both them and ourselves to our audience."[15]

The philosopher did not cherish the notion that old age is always miserable, nor does he leave that impression. On the contrary, he considers a happy old age as an important ingredient of general happiness, and he details his definition of what constitutes felicity in later maturity. Defining happiness as "prosperity combined with virtue," Aristotle infers: "From this definition of happiness, it follows that its constituent parts are:—good birth, plenty of friends, good friends, wealth, good children, plenty of children, a happy old age, also such bodily excellences as health, beauty, strength, large stature, athletic powers, together with fame, honor, good luck, and virtue. A man cannot fail to be completely independent if he possesses these internal and these external goods . . . "[16]

Taking each of the respective goods contributing to happiness, Aristotle spells out its meaning. His concept of a happy old age seems to evidence that he was quite familiar with the dread significance of the progressive debilitating chronic diseases which presently preoccupy the attention of geriatricians. He defines:

"Happiness in old age is the coming of old age slowly and painlessly; for a man has not this happiness if he grows old either quickly, or tardily but painfully. It arises both from the excellences of the body and from good luck. If a man is not free from disease, or if he is not strong, he will not be free from suffering; nor can he continue to live a long and painless life unless he has good luck. There is indeed, a capacity for long life that is quite independent of health or strength; for many people live long who lack the excellences of the body but for our present purpose there is no use in going into the details of this."[17]

In conclusion, it is perhaps worthy of mention that Aristotle wrote a brief formal essay "On Old Age" and another "On Length of Life" but neither contains any additional observations of significance.

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GERIATRICS

Official Journal of the
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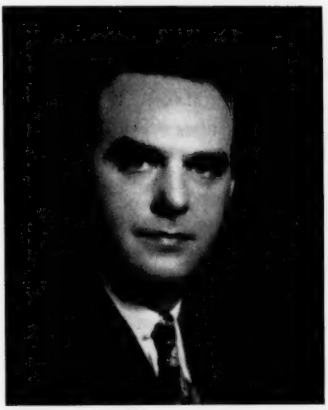
HAROLD W. LOVELL, neurologist and psychiatrist, was elected president of the American Geriatrics Society at the annual meeting June 1, 1950.

A native of Logansport, Indiana, Dr. Lovell is a graduate of the University of Michigan and received his M.D. degree there in 1929. He later served his internship and neurology residency and taught neurology at the University of Michigan Medical School and Hospital.



HAROLD W. LOVELL, M.D.
PRESIDENT 1950-1951

From 1932 to 1937, he was resident neuropsychiatrist at the University of Iowa Hospital, and an assistant professor in the medical college. His next appointment was that of Rockefeller Fellow at the Henry Phipps Clinic of Johns Hopkins Hospital in 1937-1938, after which he became associate physician at the Four Winds Sanitarium at Katonah, N. Y.

In December, 1941, Dr. Lovell was certified by the American Board of Psychiatry and Neurology, and shortly after that became an associate in neurology and assistant attending neurologist at New York Medical College and Flower and Fifth Avenue Hospitals. In 1942, also, he was appointed psychiatrist to outpatients at the New York Hospital Payne Whitney Clinic, and joined the faculty of Cornell Medical College as instructor in psychiatry. These are his present clinical and academic affiliations.

Endocrine treatment of alcoholism has been Dr. Lovell's special interest in recent years and his papers on this subject have attracted considerable attention.

Dr. Lovell is a Fellow of the American Medical Association, the American College of Physicians, American Psychiatric Association, American Academy of Neurology, American Gerontological Society, and the New York Academy of Medicine.

Seventh Annual Meeting

The seventh annual business meeting of the American Geriatrics Society was held at the Hotel Commodore, New York City, June 1, 1950, with President Hollis E. Clow in the chair. During the preceding afternoon members and their wives visited the New York Hospital, Westchester Division, White Plains, N. Y., at Dr. Clow's invitation.

Dr. Edward J. Stieglitz, chairman of the policy committee, presented the views of his committee regarding future policy of the society. Proposals were received and turned over to the executive committee for study and action.

Dr. Richard J. Kraemer's report showed a balance of $2,117.84 in the society treasury.

Our delegate to the International Conference of Gerontology at Liege, Belgium, Dr. William B. Kountz, was granted $200.00 to help defray expenses.

The executive committee reported negotiations with the Medical Memorial Fund with a view to associating with the fund to obtain grants for research purposes. This fund will have an executive secretary and will function from an educational point of view, particularly lay education. The society voted to affiliate with this fund.

The executive committee also reported that plans are being worked out for greater cooperation with the Gerontological Society, especially through joint sponsorship of meetings with them. Plans are still under way and the executive committee will have a further report next year.

Officers for 1950-1951 were elected as follows:

President: Harold W. Lovell, M.D.

First Vice President: Willard O. Thompson, M.D.

Second Vice President: Joseph T. Freeman, M.D.

Treasurer: Richard J. Kraemer, M.D.

Secretary: Malford W. Thewlis, M.D.

Assistant Secretary: Elmer T. Gale, M.D.

Chairman of Associates: Miss Allison Vickery.

Committees appointed for the year include:

Auditors: Elmer T. Gale, M.D., and William C. Thompson, M.D.

Executive Committee: Drs. Lovell, W. O. Thompson, and Thewlis.

Membership Committee: Dr. Carl A. Williams, Chairman; Drs. Gabriel F. Greco, Harper E. Richey, F. Daniel Suttenfield, Miss Ollie Randall.

Program Committee: Dr. M. David Deren, Chairman; Drs. Joseph T. Freeman, Donald L. Burdick, Elizabeth Mason-Hohl, Frederick D. Zeman.

Publication Committee: Dr. Willard O. Thompson, Chairman; Drs. Edward B. Allen, Hollis E. Clow, Wingate M. Johnson, Malford W. Thewlis.

Education Committee: Dr. Willard O. Thompson, Chairman; Drs. Wingate M. Johnson, William J. Kerr, A. J. Carlson, V. Korenchevsky, William F. King, Edward L. Bortz, C. Ward Crampton, Elizabeth Mason-Hohl.

Scientific sessions were held on June 2 and 3, during which 29 papers on various subjects of interest were presented. The last afternoon session was devoted to a symposium on the integration of medical and social agencies in community planning for the aged.

The society's annual dinner took place on the evening of June 2, honoring Dr. John F. Erdmann. Our new president, Dr. Harold W. Lovell, was toastmaster and Dr. Willard O. Thompson, chief speaker.

The eighth annual meeting of the American Geriatrics Society will be held at Atlantic City, New Jersey, June 7, 8 and 9, 1951.

MALFORD W. THEWLIS, M.D.,
Secretary

International Conference of Gerontology

REPRESENTATIVES of 14 countries gathered at the University of Liege, Belgium, on July 10 for the first International Conference of Gerontology, organized by Professor L. Brull of Liege. The three-day conference was opened by Professor Henri Fredericq, rector of the university and honorary president of the conference, who evocated gerontology and its literature through the ages, considered its modern aspects, and fixed the actual state of gerontological researches in his welcoming address.

Professor Brull started the business session with presentation of each of the attending members, including eight from the United States; seven, Great Britain; seven, France; two, Switzerland; one, Finland; two, Denmark; one, Spain; nine, Sweden; nine, Holland; 16, Italy; 30, Belgium; two, Canada; one, Ireland; one, Portugal. Total membership of the conference was 96.

Statutes for the organization of an International Association of Gerontological Societies were discussed, modified, and finally accepted, and creation of the international group was fulfilled. A discussion followed concerning choice of a permanent location of the I.A.G.S., and it was decided to have no permanent location.

A governing body, headed by Dr. E. V. Cowdry of Washington University, St. Louis, and comprising 15 additional delegates from gerontological or geriatric societies of 13 different countries, was formed. Dr. Vladimir Korenchevsky of Oxford University, England, was named founder and permanent member of the governing body.

Societies and their representatives in the governing body are: British Society for research on aging, Prof. R. E. Tunbridge; British Medical Society for the care of the elderly, Dr. Margery Warren; American Club for research on aging, Dr. E. V. Cowdry; American Geriatrics Society, Dr. Wm. B. Kountz; French Society of Gerontology, Prof. Bourliere; French Group of Gerontological research, Dr. Huet; Swiss Group for research on aging, Dr. A. L. Vischer; Societas Gerontologica Fennica, Prof. Eeva Jalavisto; Danish Society for research on aging, Dr. Torben-Geill; Spanish Gerontological Society, Dr. Panella Casas; Swedish Society of Gerontology, Prof. von Euler; Dutch Society of Gerontology, Prof. J. G. Sleeswijk; Italian Gerontological Group, Prof. Greppi; Belgian Gerontological Group, Prof. L. Brull; Irish Group of Gerontology, Dr. J. F. Fleetwood; Portuguese Group of Gerontology, Dr. Reis.

Scientific sessions began on Monday afternoon, July 10, and ended Wednesday evening, July 12, with 33 communications, each followed by profitable discussions. The program was divided according to the broad subjects of: arteriosclerosis; heart, kidney and blood vessels; nutrition; and endocrinology.

At a dinner meeting of the governing body, given by Professor Brull, it was decided that a constitution should be drawn legally according to the laws of Belgium, and that the next meeting should be held in September, 1951, in the United States, preferably at St. Louis.

Aims of the Association

1. The Association shall be called "The International Association of the Gerontological Societies."
2. The Association is instituted for two main purposes:
   (a) to represent the associated gerontological societies or groups in all matters of foreign or international affairs;
   (b) to facilitate biological, medical and social gerontological research in the associated gerontological societies by all possible means; in particular, by facilitating the cooperation among willing members of these societies.

Governing Body of the Association

3. The business of the association shall be conducted by the governing body, consisting of members elected for this purpose by each of the associated societies.
4. Each society shall elect one member only into this governing body.
5. From these elected members, at the general conferences of the association, by a simple majority vote shall be elected the executive committee of the governing body, consisting of president, three vice presidents, three honorary treasurers and two honorary secretaries. An honorary treasurer, however, may be elected by the general conference of the association from non-members of the associated societies. In such a case he will have the right to vote only on questions relating to the finances of the society.
6. The governing body and its executive committee shall be elected and shall serve for a period between two consecutive general conferences. The officers both of the governing body and its executive committee can be re-elected by their respective electors.
7. During the periods between the conferences of the association any business, on which voting or the opinion of the members of the association is necessary, shall be conducted by the executive committee in writing.

Membership

8. At the establishment of the association during the first international conference in July, 1950, in Liège, all gerontological societies and groups taking part in this conference shall become members of the association.
9. Any other or newly-formed gerontological societies or groups, which would like to become members of the association, have to be nominated at least by two societies or groups, which are already members of the association, and elected unanimously at the general conference of the association.

Finance

10. The funds or estates of the association shall be derived from a) the annual subscription of each gerontological society of ten pounds or such a sum as will correspond to this amount in any other currency; b) voluntary donations; c) grants from suitable foundations or government organizations; d) any other sources approved by the governing body of the association.
11. The executive committee of the governing body of the association shall have the right to take any necessary steps to obtain funds or estates for the association or its member-societies.
12. The budget of the association shall be determined by the executive committee, and approved by ballot at the general conferences of the association.
13. The honorary treasurer shall submit the audited accounts of the finance and estates of the association to the conferences of the society.

Conferences of the Association

14. The governing body of the association shall endeavour to arrange, preferably every third year, a conference for the purpose of discussing the organization of research work, hearing reports on results already obtained, deciding the financial activities for providing the necessary funds for research carried out by each member-society, and any other business concerning the association.
15. The rules of the association can be changed if at least a three-quarter majority of the member-societies will vote in favour of such a change.

William B. Kountz, M.D.

*Socio*medical Progress

Devoted to constructive correlation of interrelationships between sociological and medical problems in the aged. . . .

The General Hospital in Community Planning for the Aged*

Martin R. Steinberg, M.D.†

IN A CONSIDERATION of the general hospital and its responsibilities in the care of the aged, we might first define the function and the responsibilities of the general hospital toward the community as a whole. The primary function of a general hospital for the care of acute illness is to collect under one roof or in one area apparatus, equipment and facilities which are necessary for the care of the sick and to enlist and train personnel expert in the use and administration of these facilities. Having posed this as a primary function, two corollaries become apparent immediately. Both of these arise from the fact that the hospital's function is not a static one, just as a community is not static. When we speak of a collection of materials and equipment, we ask for the best materials and the kind of equipment which can make possible the finest and latest techniques. This means, of course, that a corollary function of the hospital is to conduct a constant program of research for better equipment, better techniques and newer knowledge. A similar effort is necessary in order to assure the community that the personnel is most expert and that their knowledge keeps pace with or is often ahead of the latest knowledge and skills. In order to make this assurance, it becomes a corollary function of the hospital to establish and maintain a constant program of education of its doctors and nurses, its social workers and all other elements of personnel. This primary function and its corollaries are universally accepted.

There are two other functions and responsibilities of the general hospital which are not now universally accepted but are becoming more widely recognized. There are those who say that collecting facilities and personnel is of no use to the community unless they are made available to the community, and that it is the function of the hospital not only to make these personnel and skills available but to go farther and to make sure that they are used. Reference is made here to health education. This school of thought holds that the hospital must constantly bring to the community a clear picture of what is available and when it should be used and how it should be used. This, they say, can be done by lecture series or by a mail campaign or

*Read before the seventh annual meeting of the American Geriatrics Society, June 3, 1950, New York City.

†Executive Director, Mount Sinai Hospital, New York City.

by numerous other effective methods. A perhaps smaller but a growing school of thought points to the fact that, having collected the very expensive and complex machinery necessary for care of the sick and having trained the expert personnel corps, the general hospital can hardly stop there. They feel that it is a disastrous waste of potential if the hospital does not go on to develop as the center of all health activities, in other words, a community health center. In such a capacity, the hospital would provide headquarters for physicians, nurses and all other elements of personnel for the treatment of the community, and it would through its personnel assume the role of advisor in techniques and procedures for maintenance of health and prevention of disease, as well as the management and cure of illness.

Now let us look at these functions from the point of view of those who are interested in the care of the aged. We spoke first of the assemblage of materials, equipment and facilities. Are these facilities efficient and sufficient for the care of the aged? By and large, the general hospital has done a rather good job in this direction. It has done so because the aged sick do not require a great deal more or less equipment, facilities, etc., than do the sick of younger age groups. A better and perhaps a more intensive job should be done in the direction of acquiring, inventing and improving the special equipment, facilities and techniques that the aged do require. Time and space do not allow for a detailed consideration of suggested improvements, but it is possible to point to at least three directions in which improvement is necessary.

The first is the area of special apparatus for locomotion and for the prevention of bedsores. All patients benefit from early ambulation but the aged are especially prone to the dangers of prolonged bed stay. Better apparatus should be developed for aiding in locomotion and for adequate help and supports. More equipment like the multi-chambered pneumatic mattress should be used. This mattress, in which alternate chambers are inflated and deflated, gives automatically the massage necessary to prevent bedsores. Secondly, a more intensive effort should be made to develop special occupational therapy and diversional apparatus. A third field which requires study is the newer and better understanding of the elements of nutrition for the aged, especially methods of making available to them, in disease and in convalescence, nutriments that are high in protein.

In the education of personnel, special effort should be made to teach them how to assist the aged, for the aged need a great deal more attention and many special efforts on the part of the nurses, the orderlies and other attendants.

It has been mentioned that the facilities of the general hospital must be made available to the aged. It is in this field that most work needs to be done. The attitudes of many departments and some personnel are anything but praiseworthy in their reception of and feeling toward the aged. Some quotes from conversations with three types of personnel are presented below.

The social workers recall the "difficulty of agency referral and placements, which leads to frustration." They say that old people take a great deal of time, need many reassurances, repeat their stories, etc. They mention the fact that older social workers suffer in their service because they have a tendency to identify themselves and they react to this identification. The social workers have a natural tendency to copy the attitudes of the doctors and other personnel toward the aged. Finally, they point to the fact that the curricula in the schools of social work do not stress sufficiently special techniques and knowledge for work with the aged.

Admitting physicians are reluctant to admit the aged because they are poor risks. They feel that many of the aged have malignancies, and they introduce a rather specious argument that "a younger person for whom a malignancy

is excised is benefited even if he gets a five- or ten-year cure, but an aged individual does not receive a prolongation of life by a five- or ten-year cure." The admitting physicians point to the fact that the aged cannot be easily transferred to their homes or to institutions when their care is over and that they "block the beds." They, too, are concerned by the fact that the aged require a great deal of time because of their insecurity. It is difficult to get a history from them; their complaints are wide and varied and it is difficult to focus on the major cause.

The nurses, not only the younger and lower echelons in the personnel divisions but also supervisors and chiefs bring to attention the fact that older patients need a great deal more nursing than do younger ones, and that often nurses cannot and do not give the extra care. Thus they develop guilt feelings which often produce a reaction which leads to less care because, as the psychiatrists tell us, we often grow to hate the people we hurt. Much is made of the fact that old people are prone to bedsores and that bedsores are a professional demerit for the nurse. The need for nursing is detailed, and must take into consideration such things as the need for help with feeding, that they are incontinent, have "fussy" eating habits, etc.

Through all of these examples runs the curious pattern which explains away the lack of care and hostile attitudes toward the aged largely because they need more care. Surely the general hospital is the one agency which should most nearly requite the special needs of the aged within its special field, for every concept, every effort in the general hospital field is precisely for the purpose of giving relief and care and cure for acute illness and giving as much relief and as much care as is necessary. Yet we find that for a growing age group these ideals are often subverted because of a complex prejudice and discriminatory attitude. That these attitudes are prejudicial and discriminatory is beyond question, and, because they are prejudicial, they cannot be erased or changed by simple reasoning. These attitudes must be sought out, analyzed and studied, and out of this study an educational program must be built which will expose the prejudice. It is a credit to the general hospital that these attitudes characterize not too great a portion of the personnel and that educational programs are being begun. Educational programs will perhaps take a great deal of time, and we should like to pose the possibility for a short term improvement in conjunction with the longer program. We are testing such a short term program now at our hospital.

The program consists of appointing a clinic group who are especially interested in the care of the aged and asking them to see the aged as they enter the hospital and to become agents for them in the sense that they ask for the necessary consultations and they supervise the service. We hope that with such an agency all of our personnel will soon find that, among other things, a group of physicians with prestige is interested in and critical of the care which is being given to the aged. We hope thus to use the prestige of the geriatricians for the immediate benefit of the aged patient.

In addition to making the facilities of the hospital available to the aged by improving the attitudes of its personnel, more can be done in the direction of availability by effecting a closer liaison with the old age institutions. The Mount Sinai Hospital, for instance, has effected a formal liaison with The Home for Aged and Infirm Hebrews. The arrangement is that we consider the infirmary of that institution an extension of our hospital and we take the patients who need general hospital care as transfers. Thus they are given a priority in admission. The arrangement is an easy one because the institution assures us that they will retransfer the patient as soon as the period of care in the hospital is completed. Such an arrangement should certainly be effected by hospitals with neighboring institu-

tions for the aged wherever possible. The hospital might also consider the possibility of extending the use of its facilities to the aged in their private homes. Montefiore Hospital in New York City has been one of the pioneers in that effort, and has instituted a rather successful and efficient method of caring for chronic disease patients in the home. The result has been that many patients have avoided hospitalization and have been given the comfort of care in familiar surroundings by their own families. The hospital supplies the services of the physicians and special equipment which can be transported. Their experiences can surely be modified to take care of patients who have acute diseases. By such a process, the aged might remain in their homes for a much longer period, and the increased security that this would give the family would reduce the urgency to institutionalize the aged member of the family.

Finally, in considering the role of the hospital in the field of community health education, it would be highly beneficial if the hospital were to make it known to the community that it is not only prepared by way of equipment, techniques, etc., to treat the aged but that it is ready and willing to receive them, and that for a large percentage of their ailments help can be given in a relatively short time. Such a message would tend to decrease the anxiety of the families of the aged, and it might in the long run make it possible to keep the aged as members of the family for much longer periods.

In summarizing the problem of care of the aged by the general hospital, we repeat that what is being done for all age groups including the aged is good and often remarkable; that special efforts to improve the facilities for the care of the aged should include research in specialized equipment and techniques of occupational therapy and physical medicine and in nutrition; and that perhaps the most urgent task is to study and change the attitudes of that portion of the personnel which today is guilty of prejudicial attitudes. Having accomplished these aims, the effective integration of the general hospital with all other agencies for the care of the aged will go a long way toward making old age the dignified period of reward which it should be.

*Hospitals and the Elderly**

Marcus Kogel, M.D.

WITH THE age of the population steadily increasing, rearrangement is necessary within the general hospital to provide properly and economically for aged patients.

The following suggestions are made: 1. Development of a chronic disease wing for aged patients. 2. Provision for a suite of soundproofed rooms and ancillary facilities for temporary care of elderly psychotics, whose disturbed episodes are often transitory. 3. Organization of a dynamic program of rehabilitation to redevelop in the aged patient the ability to meet the daily demands of living. 4. Establishment of a home care program. 5. Provision for the ambulant aged to receive prompt attention and good care in the outpatient department.

To supplement the chronic disease service of the general hospitals, large cities need a hospital for the chronically ill aged. This hospital should be pleasant and homelike with more than the usual physical comforts, protection from accidents and special psychological care. Nutritional elements of an adequate diet must be supplied in generous amounts and in an attractive form which can be masticated and digested by elderly persons.

*Hospitals and the Elderly. New York Med. 6:23-25, 1950.

Cardiovascular Disease

Louis H. Ziegler, M.D., 1949. New York: Grune and Stratton, Inc. 551 pages, $10.00

The reviewer finds this book to be an extremely informative and valuable addition to our cardiovascular literature. The entire book is well systematized. Discussion is concise and more thorough than one would expect in a book of this size covering so large a field. Each single subject is well presented. This is done in a very orderly fashion so that it is a simple thing to refer to any portion of this book and obtain information which is of value to the average clinician concerning any part of cardiovascular disease. In fact, the presentation is so well organized that it gives one the impression of a series of lectures prepared for students. The book certainly would be understandable to the average student of medicine and also to the average clinician. It is admitted that each of the chapters in this book might be enlarged, but the author has done an excellent job of condensing his material into a worthwhile book, leaving out material which is mostly controversial.

Special mention should be made concerning psychosomatic cardiovascular manifestation. The author seems to have good insight into this problem and presents some of the newer viewpoints very concisely and accurately.

ARTHUR C. KERKHOF, M.D.
Minneapolis, Minnesota

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Medical Management of Gastrointestinal Disorders

Garnett Cherry, M.D. 1950. Chicago: Year Book Publishers. $6.75

This is one of a series of manuals designed to inform the physician in general practice on special subjects. Diseases of the gastrointestinal tract are expounded in terms of common complaints and symptoms, and associated physical findings are considered as diagnostic clues and guides to plan the search for contributing information. Interpolated chapters deal with laboratory and roentgenographic procedures, with management of peptic ulcer, liver and gallbladder disease, gastric cancer and food allergies. Psychoneurotic manifestations and origin of gastrointestinal disturbances are stressed. Emphasis is given to diagnostic and therapeutic methods which have been proved, but are contemporary.

The charge of bias and dogmatism is anticipated and refuted on the ground that the statement of an individual opinion about a particular matter is less confusing and consequently more helpful than the discussion of several divergent concepts. That is, the author chooses diagnostic performance, interprets signs or propounds therapy without submitting supporting evidence. In most instances his declarations are sound and sensible; on some points, valid objections may be raised.

The book is a convenient size, well printed and easy to read. The index is good. Diet lists are suitable for patients' use.

JAMES B. CAREY, M.D.
Minneapolis, Minnesota

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Seelische Wandlungen beim alternden Menschen

(Emotional Changes in the Aging)

A. L. Visher. 1949. Switzerland: Benno Schwabe & Company. 216 pages, $3.50

This volume, as well as an earlier book by the same author, "Age as Destiny and Accomplishment," combines erudition and the experience of a medical psychologist in an attempt to describe emotional aspects of aging. Raw materials of literature and philosopy and personal notes and letters of elderly people, mainly poets, writers and thinkers, are analyzed for attitudes and feelings distinctively typical of the second half of life. After an introduction which states the problem and presents a discussion of the psychological aspects of different stages of life, the changes in sociological conditions with advancing age are examined in a third chapter and are thought to account in part for the distinctive behaviour of aging persons. Further chapters examine inter alia: the phenomenon of "growing old", attitudes towards the past, the future and towards death, the experience of "transitoriness", the sensation of leisure and concentrate upon the changing concept of time in the aging, this latter being considered as another determinant of distinctively characteristic emotions.

The concluding chapter brings examples of emotional maturity in the period of decline of the somatic biological curve.

The style is not involved, even in the many necessarily abstract considerations. The book has literary as well as psychological value, and may help people of different ages understand one another's attitudes.

MAURICE B. VISSCHER, M.D.
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DIGESTS *from Current Literature*

Geriatric Dermatoses.

C. GUY LANE, M.D., and ETHEL M. ROCKWOOD, M.D., *New England J. Med.*, 240: 772-777 (NOV.), 1949.

Senile keratosis, epithelioma, seborrheic keratosis, eczema and contact dermatitis accounted for 50 per cent of the skin diseases found in a series of elderly patients. Records of 2000 private patients over sixty years of age were reviewed by C. Guy Lane, M.D., and Ethel M. Rockwood, M.D.

Senile keratosis and epithelioma comprised 28 per cent of the cases, and often occurred in the same patient, usually on the face or hands. These precancerous lesions are usually red, scaly and sharply outlined. A two to four per cent salicylic and sulfur ointment controls scaling and crusting. Treatment is by desiccation, radium or roentgen ray, or by trichlocacetic acid. If infiltration or ulceration develops, the disease is treated as basal-cell epithelioma. The lesion is typified by a pearly nodule or ulcer with a pearly border and central crust.

Seborrheic keratosis, or senile flat wart, was found, usually on covered parts of the body, such as the upper back, shoulders and chest. A hereditary predisposition was noted. The lesions seldom become malignant. Removal except for cosmetic reasons is unnecessary.

Half the cases of pruritus were of the generalized senile type, with no lesions except from scratching. Cold weather is a causative factor. Elimination of soap irritation and use of a mild emollient provided relief. For localized pruritus, phenol, menthol and camphor were used, with mild sedation as a temporary measure, and fractional roentgen therapy was used in selected cases.

Treatment should generally be adapted to the patient, distinguishing essential procedures from therapy which can be modified, such as diet.

The Eye in the Advancing Years.

MORGAN B. RAIFORD, M.D., *J.M.A. Georgia*, 39:66-70, 1950.

Age begins to limit visual scope and flexibility in the late thirties, but much disability can be prevented by early treatment, according to Morgan B. Raiford, M.D., of Atlanta, Georgia. He reviews several types of dysfunction.

Changes in visual acuity may be due to the climacteric in women or men. Autonomic imbalance causing instability of convergence and accommodation is often amenable to estrogens or other hormones. Among metabolic disorders of the elderly are diabetic changes in the variability of refraction. Abrupt loss of sight, total or segmental, is generally due to arteriosclerotic thrombosis of a central retinal artery or branch. Blood coaguability should at once be reduced by dicoumarol, and the level that lowers congestion of the posterior ocular segment should be maintained.

The eyelids droop because orbital fat is absorbed and levator tone lost. Sudden ptosis may result from lesions of oculomotor nerves.

Ectropion is brought about by relaxation of the orbicularis muscle and deformity of the tarsal plate. Entropion, due to spasm and tarsal contraction, rubs the lashes against the cornea and produces ulcer and scar tissue. Ziegler cauterization or surgical repair at the anterior angle may be helpful. Trichiasis should be eliminated by fine electrocautery.

Since epithelial and basal cell cancers about the eyelids are common, all growths in this area should be biopsied and malignant tumors excised promptly. Surplus tissue due to blepharochalasis, a fat deposit associated with senile atrophy and weakness, prevents raising of the upper lid. Surplus tissue may be removed by excision or cautery.

The lacrimal apparatus is frequently inadequate because glandular function is retarded and puncta are everted or inverted. The conjunctiva dries, and inflammation with tearing results. Lacrimal puncta should be dilated. In place of normal tears, 0.7 per cent gelatin in 0.35 per cent saline is employed for irrigation. Conjunctivitis is alleviated by a warm solution of 0.5 gm. sodium chloride and 0.3 gm. sodium bicarbonate in 250 cc. of distilled water.

The conjunctiva may be irritated by pinguecula, fatty deposits that infiltrate the inner half of the bulbar surface. Lesions can be excised. The angular conjunctivitis of spring and fall is usually due to the Morax-Axenfeld diplobacillus and relieved by 0.5 per cent zinc sulfate in a buffered solution.

Flattening of the cornea creates astigmatism. Arcus senilis does not impair vision. The iris may be hyalinized and in some cases proliferating epithelial pigments migrate to the iris angle and cause glaucoma. The lens enlarges slightly throughout life, and the increased pressure favors hydrolysis of protein and deposition of calcium. In the prodromal stage of cataract, increased lenticular size may improve vision, give a false sense of security, and thus heighten tension. As soon as cataract affects social or economic function the lens should be removed.

Every physical examination should include palpation for increased intraocular pressure. Glaucoma is responsible for about 11 per cent of blindness in this country and is rarely controlled by drugs. An operation is necessary in most cases and should be prompt to save vision.

Problems of Old Age in General Practice.

JOHN FINLAYSON FLEETWOOD, *Journal of the Medical Association of Erie*, January, 1950.

Normal changes and physiological figures in old age, with senile variations of diseases amenable to treatment by the general practitioner are presented by John Finlayson Fleetwood. Stress is laid on the possibility of cure or alleviation of diseases formerly regarded as incurable by reason of the patients' age.

Much is learned by observation in examination of the elderly patient. Preliminary conversation permits inconspicuous examination of the skin, veins, posture, mental agility, respiration and speech.

Physiological measurements most commonly taken are temperature, pulse rate and blood pressure. Very warm air may cause a marked rise in body temperature. Conversely, in inflammatory disease slight variation of temperature may be of disproportionate significance. The pulse rate varies from 58 to 120 beats per minute in active old people. Blood pressures vary considerably with average figures of 136/90 for men and 158/98 for women over the age of 65.

Many of the mental changes in later years have their origin in sclerosis of the cerebral arteries. Symptoms progress from headache, vertigo and easy fatigue to memory and attention failure, character deterioration and sentimentalism. Nicotinic acid is of value but the prolonged use of sedatives is cautioned against as susceptibility varies widely.

Involutional melancholia is more common in the aging than in the aged. Early symptoms include insomnia, restlessness and easy fatigability progressing into a feeling of guilt and unworthiness and deep hypochondria. Electroconvulsive therapy yields good results.

Disabilities of the respiratory system are many, with some degree of emphysema a constant finding. The vital capacity is often seriously low. In early cases the maintenance and extension of thoracic mobility is accomplished by stimulating expiration.

Pneumonia calls for special attention as a temperature of 98.4° F. is quite compatible with consolidation. Penicillin, sulfonamides and oxygen are used but nursing is of the most urgent importance.

Pulmonary carcinoma should be suspected by weight loss, fever, cough, anemia, hemoptysis or anorexia. Tuberculosis should not be forgotten. Monotheamine (theophylline monoethanolamine) is a useful drug in bronchial asthma and cardiac dyspnea.

Coronary thrombosis in the elderly may be painless with congestive heart failure the first sign. Angina pectoris may be present with mild symptoms. Treatment with nitroglycerine or amyl nitrite gives satisfactory results more often than in a young person.

Prostatic enlargement is the most common genito-urinary condition in men and surgical removal is the treatment of choice.

Estrogens and testosterone are most useful in geriatric medicine. Oestrodial benzoate, massaged into the area once daily, alleviates the intolerable itching accompanying vulvar hyperplasia. The presenile male climacteric syndrome is often treated successfully with methyl testosterone sublingually.

Chronic Marrow Failure, Myelosclerosis and Extramedullary Hematopoiesis.

JOHN P. WYATT, M.D., and SHELDON C. SOMMERS, M.D., *Blood*, 5:239-347, 1950.

Anemia, leukocytosis, large liver and spleen, jaundice, and hemorrhages in elderly patients may indicate hepatic disease, leukemia, or carcinomatous metastases. Therapy, therefore, should be based upon correct interpretation of the changes in the circulating blood. From observation of 30 cases of bone marrow failure, myelosclerosis, and osteosclerosis, John P. Wyatt, M.D., and Sheldon C. Sommers, M.D., conclude that 1) the fundamental primary lesion is necrosis of partly matured erythroid and myeloid bone marrow cells; 2) reactive overgrowth of the surviving, usually immature, cells follow; 3) extramedullary hematopoiesis appears; 4) the reticulum and stromal tissues in the marrow and sites of myeloid metaplasia are intact and hyperplastic; and 5) the spleen is enlarged from three to thirty times normal, and the liver is also enlarged one and one-half to four times the usual weight.

Of first diagnostic importance is the microscopic appearance of the marrow. Hyperplasia occurs early, with displacement of fat. Megakaryocytes and both myelopoietic and erythropoietic elements are increased. The increased number of pale round cells with a finely stippled nuclear chromatin, corresponding to stem cells, and giving no hint as to their ultimate fate is distinctive.

Careful study may reveal pyknotic and necrobiotic alterations of many individual immature cells. Under low power marrow reticulum cells, increased in size and number, produce a characteristic subdivided or compartmented appearance. Sheets of neoplastic hematopoietic cells stretching from one bone trabecula to the next, as in leukemia, are absent.

In some cases the terminal stage involves a distinct type of new bone formation in which bone is deposited in a layer about part or all of the old trabecular surfaces.

Of the 30 cases reported, 10 were related to extrinsic toxic agents, liver dysfunction, endocrine disease, chronic hemorrhage or hemolysis, or cardiovascular disease. In 10 other cases, patients had chronic inflammations including pyelonephritis, bronchitis, and arthritis, which probably represented an additional burden upon an inadequate hematopoietic system. Terminal bronchopneumonia and generalized tuberculosis were common.

Nutrition Problems of Geriatric Medicine.

EDWARD J. STIEGLITZ, M.D., *J.A.M.A.*, 142: 1070-1077, 1950.

Diet in later years must be planned for individual needs as well as the deficiencies common in old age. Edward J. Stieglitz, M.D., of Washington, D. C., cautions against both undereating and overeating. After the fourth decade, aging varies greatly from one person to another and within the body. Digestive, circulatory, and other systemic disorders produce cellular malnutrition leading to the various degenerative diseases. In addition, everyone bears the accumulated effects of past toxic, psychic, and traumatic injury.

With advancing years, the kidneys become less efficient and require liberal amounts of water. Glucose is assimilated more slowly, thus blood sugar is frequently reduced. If the heart is deprived of necessary energy, angina pectoris may occur. The aging body cannot take care of surplus alkali. Uric acid metabolism decreases, so that gout is precipitated by minor indiscretions. For various reasons, calcium is poorly absorbed.

Beverages should supply a urinary flow of 1,500 cc. daily. In hot weather three liters or more may be required and in cool weather about two liters, taken in small frequent drinks.

Protein deficit is often shown by habitual fatigue. About one gm. per kilogram of body weight is utilized daily by an adult, but two gm. are given to restore positive balance. Requirements are met by cheese, lean meats, and skim milk or a dried milk product with iron and vitamins. Before and after surgery hydrolyzed amino acids may be given intravenously.

Calcium balance is maintained by the major food sources of milk, cheese, ice cream, green vegetables, and legumes. An adult should have 12 mg. of iron daily, and most older persons should take some form of iron salts.

Soft bulk is furnished by vegetable roots and leaves, such as beets, turnips, parsnips, carrots, spinach, lettuce, cauliflower, brussels sprouts, and broccoli. Roughage in bran, celery and other foods that will not pass through a collander is too irritating for the aged bowel. Strong condiments and spices are undesirable.

Psychiatry in Geriatrics.

W. P. GARDNER, M.D., *Minnesota Medicine*, 33:353, 1950.

Maladjustments and behavioral breakdowns occur at a high rate in the age group 65 and over. W. P. Gardner, M.D., feels that the physical aspects of the aging process are of definite etiological significance; in addition to the narrowing of the cerebral arteries, poor absorption of vitamins and endocrine imbalances are common manifestations of aging.

Social elements also play a role. The older person is progressively shunted away from both work group and family setting. The family group scatters, friends and relatives die, and the aged person is left without firm social ties.

Elderly persons of a stable personality tend to withstand considerable amounts of cerebral damage and environmental pressure without exhibiting serious psychiatric manifestations; whereas individuals who have been poorly adjusted earlier in life often fare badly under such conditions.

The family can do much to provide for the aged person's psychological needs. The individual's psychological needs, which have been delineated by Laycock as follows, are especially applicable to the elderly.

1. The need for affection, to live in reciprocal warm regard with one or more human beings.
2. The need for belonging, to be a desired and desirable member of a group.
3. The need for independence, to order one's own life reasonably and make one's own decisions.
4. The need for achievement, to do things, to accomplish tasks, to create things and find success.
5. The need for recognition, to feel that one's personality and conduct meet the reasonable approval of one's equals.
6. The need for self-esteem, to feel that one's personality and conduct come up reasonably to one's own inner standards.

The family and other associates must help the aged person obtain psychological needs in order that self-esteem may be maintained.

Problems of Institutional Care of the Aged.

DAVID A. BOYD, JR., M.D., *American J. Psychiatry*, 106:616-619, 1950.

State supported and managed institutions with a rounded and complete program of physical and psychologic care are proposed as a solution to present unsatisfactory methods of caring for mildly deteriorated elderly patients. David A. Boyd, Jr., M.D., suggests such a program as a means of permitting the elderly to maintain dignity, self-respect, and a sense of worth as well as providing physical necessities.

To minimize physical dangers and permit maximal freedom, the colony of semi-village homes would be located in accessible rural areas. Limited professional staffs assisted by middle-aged matrons would manage such institutions economically. Considerable saving would also be made by transfer to these institutions of senile patients unnecessarily committed to state psychiatric hospitals. Skills and assets of aged people living in the proposed institutions would be utilized to the fullest with the continued activity and participation in vocational and intellectual activities serving as aids in overcoming mental confusion.

GERIATRICS

Rheumatic Valvular Disease in the Aged*

Howard B. Sprague, M.D.,† *and David B. Carmichael, Jr.,* M.D.‡

UNTIL a decade ago it was traditional to look upon rheumatic cardiac disease as restricted largely to youth and early adult life. Although an occasional mention was made of survival into the geriatric period, this was limited primarily to statistical surveys.[1-6] In 1940 and in succeeding years the phenomenon of rheumatic heart disease in the aged gradually became an accepted possibility and a considerable number of reports have appeared to substantiate this conclusion.[7-13,45] In spite of more general recognition by clinicians and pathologists few studies have been undertaken which have been limited to the senior age groups.

It is the purpose of this paper to study the clinical and pathologic data in rheumatic heart disease in the individual of fifty and beyond. Considerations have been directed to incidence, pathologic criteria, history, clinical findings, factors leading to morbidity, and factors causing death.

PATHOLOGY

AUTOPSY PROTOCOLS from the Department of Pathology of the Massachusetts General Hospital were reviewed including those from the period of October 9, 1944 to March 9, 1949. This group consisted of 2,057 cases, of which 1,750 were complete autopsies of patients expiring in this hospital. Selection was then limited to the 1,025 consecutive deaths occurring in patients of age 50 and above (Table I).

*Presented before the seventh annual meeting of the American Geriatrics Society, New York City, June 3, 1950.

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The opinions expressed in this article are those of the authors and are not to be considered as reflecting the official views of the Department of the Navy.

TABLE I

AGE INCIDENCE OF 1,025 CONSECUTIVE AUTOPSIES IN CASES OVER AGE 49

Age group	*Number of cases*
50-54	134
55-59	186
60-64	191
65-69	189
70-74	152
75-79	108
80-84	35
85-89	25
90-94	5
	TOTAL 1,025 cases

Each of the selected 1,025 cases was surveyed for changes indicative of recent or old rheumatic infection. It is well appreciated that there is no unanimity of opinion among pathologists either as to gross or microscopic changes which may be considered diagnostic of rheumatic cardiac involvement. The literature is replete with methods of evaluation which frequently

TABLE II

PATHOLOGIC CRITERIA

Group A (including AS)*	Group A (excluding AS)*	Group B (including AS)*	Group B (excluding AS)*
50-54—19 (11M; 8F)	16	15	12
55-59—19 (11M; 8F)	17	15	13
60-64—21 (14M; 7F)	16	17	12
65-69—19 (13M; 6F)	14	19	14
70-74—18 (12M; 6F)	12	16	10
75-79—11 (7M; 4F)	7	9	5
80-84— 5 (3M; 2F)	3	5	1
85-89— 2 (2M; 0F)	1	2	0
90-94— 1 (0M; 1F)	0	1	0
TOTAL—115 cases	TOTAL—86	TOTAL—99	TOTAL—67
Male—73	Male—48	Male—62	Male—35
Female—42	Female—38	Female—37	Female—32

*Aortic stenosis

differ considerably. As a result of this controversy it was felt desirable to define gross and anatomical criteria acceptable for inclusion in this series. All cases accepted by the Department of Pathology were included in Group A (Tables II, III). The diagnosis was based upon the most generally accepted stigmata of rheumatic cardiac involvement. Cases exhibiting one or more of the following gross lesions were considered acceptable for inclusion: shortening, fusion, or thickening of the chordae tendineae with or without fibrosis of the tips of the papillary muscles; gross vascularization or rolling of the free margins of the valves or cusps in the absence of evidence of lues or bacterial endo-

TABLE III

OVERALL PERCENTAGE ACCORDING TO PATHOLOGIC CRITERIA

Group A	11.2 %
Group B	9.65%
Group A (excluding AS)*	8.39%
Group B (excluding AS)*	6.53%

*Aortic stenosis

carditis; typical verrucae of the valve margins; thickening of the valves or cusps most marked at the free borders in association with at least one of the other criteria; significant fibrous adhesions of the commissures resulting in interadherence; and typical left auricular patches of thickened endocardium (MacCallum patch). As pericarditis without valvulitis is rarely seen,[14] it was not considered as diagnostic in this series. Rheumatic involvement of the myocardium was accepted only if Aschoff nodules were found abundantly and were of characteristic pattern.[15,16,17] Connective tissue lesions of the left atrial endocardium were assumed to be of rheumatic etiology if Aschoff nodules, characteristic subendothelial plaques, vascularity and cellular exudate of the subendocardium were noted. The diagnosis was also acceptable if the valves revealed Aschoff nodules, or vascularization with arterial vessels of musculo-elastic type.[15]

In an effort to assemble a group of cases which would satisfy the most rigid criteria, cases in Group A were re-evaluated on the basis of the gross and microscopic descriptions. Since the shadings between degenerative and inflammatory change may elude positive definition,[8] and since it was felt that further restriction might exclude a few cases which were not truly of rheumatic origin, a subgroup was formed, labeled Group B. The gross criteria include: moderate or marked degrees of valvular thickening giving the typical pattern long accepted as being indicative of rheumatic valvular stenosis; gross vascularization of valves in the absence of lues or bacterial endocarditis; shortening, thickening, and fusion of chordae tendineae with or without papillary muscle fibrosis; and the verrucae of rheumatic valvulitis. Microscopic evidence included Aschoff nodules, the left auricular changes previously described, and typical vascularization of valves.

In the majority of cases the diagnosis was established on the gross findings since multiple cardiac tissue blocks are seldom taken in routine autopsies. In this respect the work of Hall and Anderson[18] is of great interest. They were able to find microscopic evidence suggestive of old rheumatic activity in over 90 per cent of hearts passed as normal on gross examination, taken from patients who gave no history of previous rheumatic infection.

Patients demonstrating bacterial endocarditis at autopsy were included only if valves uninvolved by the septic process revealed stigmata of rheumatic infection, or if the pathologist concluded that the acute or subacute lesion was implanted upon a valve showing evidence of previous inflammatory change.[15,16,1] The problem of calcified aortic stenosis presented another enigma of considerable importance. As may be seen in the above table, statistics were compiled both including and excluding this lesion. Evidence accumulating in the literature, however, indicates that the majority of investigators consider this valvular deformity to be consistently of rheumatic origin.

GENERAL CLINICAL DATA

After assembling the pathologic data, hospital charts were consulted and an effort made to evaluate these cases in light of the age attained. One

hundred twelve of the 115 charts were available for statistical analysis. It was immediately noted that far less than the usual average gave a positive history of accepted manifestations of the acute rheumatic state. A total of 28 cases (25 per cent) gave a history suggestive of rheumatic fever in youth. (Table IV). Only an occasional patient described frequent bouts of tonsil-

TABLE IV
HISTORY OF EARLY ACUTE RHEUMATISM

Migratory polyarthritis	13 (11.6%)
Cardiac murmur noted in youth	7
Crippling "growing pains"	7
Chorea	1
TOTAL—28 cases (25%)	

litis and upper respiratory infection. There were two who recalled multiple incidents of epistaxis. The family history was not recorded in detail in many charts, but cases were infrequent in which a positive history of familial rheumatic heart disease was obtained. Rosenberg[19] reports a figure of 38 per cent in young adults; Cookson[12] reports 39.5 per cent positive history in cases of mitral stenosis over 50; and Baker and Musgrave[11] report 30.2 per cent in similar cases.

The problem of repeated subclinical rheumatic reactivation can only be a source of speculation. It is of interest to read the number of reports which postulate a high recurrence rate in the course of rheumatic fever.[20-26] Among the 28 cases in our series giving a positive early history only nine recalled a period of illness suggestive of reactivation of the rheumatic process. These nine cases had 15 recurrences, one case having four well-defined periods of polyarthritis without residual joint changes to suggest rheumatoid arthritis. Hall and Anderson's conclusions would imply that the incidence of a positive microscopic diagnosis of rheumatic activity in the aged would depend upon the diligence of the search and the criteria acceptable. Our studies were not sufficiently complete to state positively the percentage of cases showing rheumatic activity.

The effect of an active life upon the frequency of cardiac disability was studied. It has long been a source of speculation as to whether average physical activity has a deleterious effect upon a heart structurally damaged, but without evidence of cardiac insufficiency. Current opinion places little emphasis upon the concept that normal activity is harmful in such cases. This study lends further support to that view. Only seven of the 112 patients could be considered to have led sheltered lives. Most of these individuals had been sedentary only in their terminal years; and there was no recorded instance of a "cardiac cripple." Of the cases in which an obstetrical history was taken there were 17 women who had successfully borne children. One woman reached the ripe old age of 83 years after successfully completing 11 pregnancies; and two other women of 76 and 52, who at autopsy showed "button-hole" mitral valves, had five and seven children respectively. Many patients went through multiple major surgical procedures with impunity.

Occupational information was available in 98 instances. Data were not adequate to determine retirement age accurately, or the effect of heart disease upon the retirement decision. Nevertheless the life work of these patients does not reflect vocational restrictions. The majority of individuals worked until the onset of their terminal illness (Table V). Selection of occupation was not related to the specific valvular lesion in any consistent pattern.

TABLE V
VOCATIONAL DEMANDS

Vocation classification	*Number of patients*
Strenuous vocations	12
Moderately strenuous vocations	25
White-collar occupations	18
Housewife and mother	27
Quiet, semi-sedentary vocation	14
No occupation	2
	TOTAL—98 patients

Ehlertsen[24] has reviewed the incidence of valvular involvement and concludes that mitral stenosis is found most commonly, and the isolated aortic lesion least commonly. This analysis depends upon the criteria of involvement which he does not define, but we have found that by accepting minor lesions, combined mitral and aortic damage is the most frequently observed.

Clinical cardiac failure of minimal to severe degree was noted in 70 patients (61.6 per cent). Of this group, death was extremely uncommon as the primary result of progressive congestive failure. Far more often the picture of congestion was seen occurring as the final event in patients afflicted with disabling infection, carcinoma, or atheromatous vascular disease. Twenty-two of these cases (31.4 per cent) had terminal congestion which was measured in hours. Another segment comprising ten cases (14.3 per cent) had relatively acute heart failure of less than one month duration. The remaining cases (54.3 per cent) had suffered intermittently from congestive changes for periods as long as 30 years. Twenty cases measured their symptoms in years and the remaining 18 cases in months. Two patients had experienced varying degrees of chronic failure for more than 20 years. Twenty-nine of these patients had predominantly mitral lesions, and in 23 the aortic valve was more markedly diseased. The remainder had both aortic and mitral lesions, which at post mortem appeared to be equally involved. Among these 70 cases it was interesting to note that the clinical findings pointed clearly to the correct valvular lesion in all but 12 instances.

Since cardiac failure in rheumatic heart disease is commonly observed to follow closely on a change from sinus rhythm to auricular fibrillation, an attempt was made at correlation in this group of cases. As the majority were seen only in the last few weeks or months of their lives and previous data were often incomplete, such an analysis could not be adequately completed. It was notable that in eight cases under observation during or immediately after the onset of auricular fibrillation congestive failure followed rapidly. In one other case existing cardiac insufficiency was markedly aggravated by

the onset of auricular fibrillation. Similar derogatory effect on the damaged heart was noted in a case in which paroxysmal auricular tachycardia occurred, and in another in which failure coincided with an episode of auricular flutter. Auricular fibrillation occurred in 25 instances, and in all of these cases congestive changes appeared before death. Auricular flutter was recorded twice; ventricular tachycardia on three occasions; paroxysmal auricular tachycardia twice; and cardiac irritability as indicated by frequent premature contractions in 13 instances. Prolongation of the AV conduction time was observed in eight instances and in one of these cases complete heart block occurred. Two others had 2:1 heart block.

ELECTROCARDIOGRAMS were obtained in 64 cases. Left axis deviation was noted on ten occasions, and a tendency to left axis in 11 instances. Right axis shift occurred four times and a tendency to right axis deviation in two more records. Bundle branch block appeared in seven tracings and six were indicative of block in the left bundle, with one case of right bundle branch block. As might be reasonably expected, axis deviations and hypertrophy patterns reflected quite well the predominant site of valvular damage.

The coronary arteries were described in 114 cases. Minimal involvement was considered to be present when atheromatous plaques occurred without significant narrowing of the lumen. Moderate change was assumed in the event of narrowing without occlusions, and marked change indicated occlusion of one or more main branches of the coronary arteries (Table VI).

TABLE VI
CORONARY SCLEROSIS

Degree of Sclerosis	*Number of Cases*
Negative	22
Minimal	53
Moderate	25
Marked	14
	TOTAL—114 cases

As well as could be assessed from the records the factor precipitating death in each instance was determined. These data are assembled in Table VII.

TABLE VII
CAUSE OF DEATH

Cause of death	*Number of cases*	*Cause of death*	*Number of cases*
Acute and chronic congestive heart failure	22	Cerebral embolism	4
Cancer	12	Cerebral hemorrhage	4
Infection	10	Hepatic cirrhosis	2
Postoperative complications	9	Addisonian crisis	2
Subacute bacterial endocarditis	7	Active rheumatic carditis	1
Acute bacterial endocarditis	6	Active rheumatic carditis plus myocardial infarct	1
Acute myocardial infarction	6	Postoperative pulmonary embolism	1
Massive pulmonary embolism	5	Subacute yellow atrophy of the liver	1
Uremia	5	Mesenteric embolism	1
Leukemia	5	Delirium tremens	1
Cardiac failure plus infection	5	Cerebral thrombosis	1
Cardiac failure plus cancer	4		
		TOTAL—115 cases	

It is readily seen that death in 67 cases (58.3 per cent) was the result of disease of the vascular system, excluding post-operative complications.

Cases reaching the eightieth year were reviewed separately and the results are indicated in Table VIII. No instance of auricular fibrillation was observed in this group. One-half of the hearts exceeded 400 grams; however there were no instances of marked cardiac hypertrophy. These findings suggest that in the very aged retention of a sinus mechanism and absence of significant cardiac hypertrophy may be favorable omens.

TABLE VIII

CASES REACHING THE EIGHTIETH YEAR

	sex	*age*	*lesion*	*ht. wt.*	*rv*	*lv*	*rhythm*
M.T.	M	82	Mitral stenosis	470 gms.	4 mm.	20 mm.	Sinus
F.B.	F	83	Minimal aortic disease	200 gms.	3 mm.	15 mm.	Sinus
E.W.	M	83	Calcareous aortic stenosis		4 mm.	20 mm.	Sinus
J.I.	F	80	Mitral and aortic stenosis	420 gms.	4 mm.	14 mm.	Sinus
F.D.	M	84	Mitral insuff. and min. MS	370 gms.	3 mm.	23 mm.	Sinus
G.N.	M	88	Min. mitral and aortic disease	440 gms.	4 mm.	17 mm.	Sinus
H.B.	F	90	Mitral and aortic stenosis	300 gms.	3 mm.	16 mm.	Sinus
M.E.	M	85	Calcareous aortic stenosis	470 gms.	2 mm.	10 mm.	Sinus

MITRAL STENOSIS

FOR ONLY A FEW YEARS has it been generally realized that mitral stenosis is not tantamount to death in early or middle adulthood. As with rheumatic heart disease in general, appreciation of its existence late in life had been largely confined to statistical reports. It is now well accepted that rheumatic mitral stenosis may be seen at any age, and this subject has been thoroughly reviewed by Cookson,[12] and Baker and Musgrave.[11] Recently Rosenthal and Feigin[8] found definite mitral stenosis in 6.8 per cent of autopsies performed on aged people. Reports of 106 clinical cases in patients surviving the fiftieth year, and of another series of 38 cases have recently been contributed.[11,12]

Theories proposed to explain late survival have not been universally accepted. Some of the current suggestions are listed:

(a) gradual fibrosis of valves over a long period, without rheumatic activity.[11]
(b) slow, but continued or recurrent rheumatic activity leading eventually to extensive valvular abnormality.[21]
(c) atypical initial rheumatic infection.[11]
(d) relatively slight myocardial injury.[12]
(e) appearance of initial infection at a relatively advanced age.[9,12]
(f) relatively mild to moderate degree of mitral stenosis.[9]
(g) relatively quiet life and/or ancestral inheritance of longevity.[9]
(h) beneficial effect of concomitant hypertension.[27]

No matter what the cause of delayed morbidity, there are certain distinctive features that are presented by such patients. A lowered incidence of positive history of acute rheumatism has been commented upon by some authors.[8,11] The existence of hypertension in many of these cases has been reported,[8,12] although such findings have not been universal.[11,28] Angina

pectoris has also been reported to be very rare.[29] It has been noted that these patients do particularly well as long as sinus rhythm persists, but with the appearance of auricular fibrillation the burden is frequently insurmountable and cardiac insufficiency supervenes.

The diagnosis in this age group is slightly more difficult than in younger patients, although the characteristic mid-diastolic rumble is of great validity at any age. The electrocardiogram and chest roentgenogram are frequently influenced by arteriosclerotic or hypertensive effects. The aortic knob may be prominent and is often calcified, and the cardiac configuration may be misleading.[12]

In this series 15 cases were observed to have "button-hole" or "fish-mouth" mitral orifices. Ten more mitral valves were severely stenosed, but without the above described contours. This total of 25 cases of marked anatomical stenosis of the mitral valve constitutes 21.7 per cent of all cases of observed rheumatic heart disease, and 2.44 per cent of all patients in this series reaching the age of fifty. In seven other instances a clinical diagnosis of mitral stenosis seemed well supported, but it was decided to restrict the discussion to cases in which the findings were unequivocal. The age distribution is recorded in Table IX. The oldest patient demonstrating severe mitral stenosis was a 90-year-old woman who had coexisting aortic stenosis.

TABLE IX
AGE INCIDENCE OF MITRAL STENOSIS

Age group	*Number of cases*
50-59	13
60-69	8
70-79	2
80-89	1
90-99	1

The typical mid-diastolic murmur was recorded in 14 of these cases, and was absent in only two instances where a careful cardiac examination had been performed. In only two cases of the entire group were there no hints from cardiac auscultation that a significant valvular lesion existed. In one of these patients the correct diagnosis was indicated by the combination of recurrent congestive heart failure, auricular fibrillation, and a positive history of early rheumatic fever. In the other case suspicion was aroused by a well-marked right axis deviation in the electrocardiogram and evidence of cardiac enlargement and pulmonary congestion in the chest x-ray.

TEN PATIENTS revealed auricular fibrillation during the period of observation. No cases of angina pectoris were observed. The blood pressure was elevated above a level of 150 systolic or 90 diastolic in only 11 cases. Often this increase was the result of concomitant aortic insufficiency and in only six cases were both systolic and diastolic levels elevated simultaneously.

Fourteen patients (56 per cent) revealed evidence of pulmonary emphysema or significantly increased pulmonary fibrosis.[11] In only one instance

was evidence of old tuberculous infection observed. In 15 cases (60 per cent) the heart weight exceeded 400 grams.

Sixty-four per cent of deaths were due to vascular disease, and 40 per cent due to congestive heart failure as compared to 29.6 per cent for the group as a whole. The causes of death are recorded in Table X.

TABLE X

MITRAL STENOSIS—CAUSE OF DEATH

Cause of death	*Number of cases*
Acute or chronic congestive heart failure	8
Subacute bacterial endocarditis	3
Infection	2
Uremia	2
Cancer	2
Acute rheumatic carditis	1
Postoperative pulmonary embolism	1
Leukemia	1
Cerebral embolism	1
Cerebral hemorrhage	1
Active rheumatic carditis and hepatic cirrhosis	1
Hepatic cirrhosis	1
Myocardial infarction	1

AORTIC STENOSIS

Stenosis of the aortic valve is deserving of special consideration because of characteristics which do not pertain to other stigmata of rheumatic infection.[30] This lesion is seen predominantly in the male and is notorious for its appearance in the later decades of life. Multiple reviews have stressed these points.[30-34] As noted before, the problem of etiology remains a puzzling enigma. The high incidence of rheumatic history in these cases and the high percentage of other changes generally attributed to rheumatic fever have suggested to many that this lesion is another cardiac manifestation of rheumatic fever.[14,30-33,35,36] The clinical picture enunciated by Christian has recently been reviewed and extended by Kumpe and Bean.[37]

Twenty-nine cases were found to have well-marked anatomical aortic stenosis. This constitutes 25.2 per cent of cases of rheumatic heart disease and 2.83 per cent of all patients over the age of 50 in this series. This latter figure is somewhat higher than that reported by McGinn and White.[33] A definite history of juvenile rheumatism was obtained in seven of the 27 cases whose charts were available for study. This is roughly the same proportion as noted in the overall series. Anatomically there was definite evidence to suggest either a rheumatic etiology or concomitant rheumatic infection in 12 cases (41.4 per cent). As in the cases of mitral stenosis, in retrospect the diagnosis was quite obvious in nearly all instances. All but one patient had a murmur of at least grade II intensity heard with maximum loudness over the aortic area. In this one case an enlarged cardiac contour was present on x-ray as well as a significant apical systolic murmur. Auricular fibrillation was rather uncommon, occurring in seven cases. Cardiac enlargement existed in all but one case and there was an apical mid-diastolic rumble without anatomical evidence of mitral valve disease in five instances. Four patients

showed concomitant mitral stenosis and it was noted that these were the only female patients in the group. All of the latter were of quite advanced age, reaching 90, 80, 76, and 62 years, respectively. A systolic thrill palpable in the aortic area was felt in four cases, and a narrowed pulse pressure was recorded in six instances. The age incidence and cause of death are summarized in Tables XI and XII.

TABLE XI
AGE INCIDENCE OF AORTIC STENOSIS

Age group	*Number of cases*
50-59	5
60-69	10
70-79	10
80-89	3
90-99	1

The x-ray was of value in this lesion to demonstrate the degree of cardiac enlargement, and the diagnosis was often suggested by the cardiac contour and valvular calcification. Twenty-five cases (86.2 per cent) were correctly diagnosed ante mortem.

TABLE XII
AORTIC STENOSIS—CAUSE OF DEATH

Cause of death	*Number of cases*
Cardiac failure	9
Postoperative complications	3
Subacute bacteiral endocarditis	2
Pulmonary embolism	2
Leukemia	2
Cardiac failure and infection	2
Cancer	2
Uremia	2
Cardiac failure and cancer	1
Myocardial infarction	1
Acute bacterial endocarditis	1
Mesenteric thrombosis	1
Infection	1

ACUTE AND SUBACUTE BACTERIAL ENDOCARDITIS

THE HIGH percentage of these lesions in valves damaged by the rheumatic process is well known.[39] Prior to the advent of effective chemotherapy bacterial endocarditis was seldom a problem of geriatric medicine. Hedley, reporting in 1940, found only 30 cases of these conditions in patients over the age of 50 in a series of 288 cases in Philadelphia hospitals.[10] Gelfman reports a series in which bacterial endocarditis appearing over the age of 50 constituted 25.2 per cent of all cases with this lesion.[39] In two recent reports by Zeman, and Zeman and Siegal, extensive reviews of this subject, together with case reports have been contributed.[40,41] Some of the difficulty in diagnosis has arisen from a lack of recognition of the possibility of this complication in the aged; and the tendency for the picture of the subacute form to be obscured by chronic low-grade infections of the lungs, kidneys, or bladder. It is often a most difficult diagnosis.[23,40]

In 1,025 autopsies acute bacterial endocarditis occurred in 11 instances. In eight of these cases the infection was engrafted upon a valve apparently damaged by antecedent rheumatic infection. All but one of these latter cases revealed chronic endocarditis of both aortic and mitral valves, with one case revealing an isolated mitral lesion. Vegetations were noted on the mitral valve in all cases but one. In one case vegetations were limited to the aortic valve, and in one case vegetations involved the mitral and aortic valves and the left auricle. Four males and four females comprised the group and the average age was 68 years. The sites of initial infection were determined as well as possible, and included pneumonia, cholecystitis, mediastinal abscess following a perforated esophageal carcinoma, post-operative sub-diaphragmatic abscess, leg ulcer, and purulent bronchitis. The ante-mortem diagnosis was established in three cases by positive blood cultures of an organism subsequently cultured from the valvular vegetations.

Subacute bacterial endocarditis was seen seven times and in six instances it was the opinion of the pathologist that the lesions were implanted upon valves showing changes suggestive of chronic rheumatic endocarditis. Vegetations were localized to the aortic valves in four cases, the mitral valves in one case, and combined valvular involvement was found in the other. The underlying chronic endocarditis was limited to the aortic valve in two instances, aortic and mitral in two, aortic, mitral and pulmonic in one, and aortic, mitral, and tricuspid in the final case. There were three males and three females in the group and the average age was 58 years. The infrequency of subacute bacterial endocarditis in the presence of auricular fibrillation or congestive heart failure has been stressed by many.[38,42,43] In this series one case of subacute endocarditis exhibited auricular fibrillation and this was the only instance where congestive heart failure of long duration was observed. In only two instances was terminal cardiac failure noted.

The relative infrequency of bacterial localization upon a markedly stenotic mitral valve has been reported.[44] In this group of cases subacute bacterial endocarditis occurred in three of the 25 cases of severe mitral stenosis; however, in but one instance was a stenotic mitral valve the site of vegetations. In the remaining two cases the lesions were implanted upon aortic valves concomitantly damaged by the rheumatic process.

SUMMARY AND CONCLUSIONS

With the advent of improved methods of treatment of acute rheumatic fever, with superior therapeutic measures in the therapy of congestive heart failure, and with the chemotherapeutic agents to control acute and subacute bacterial endocarditis, it must be assumed that rheumatic heart disease will be a more frequent problem in geriatrics. The following conclusions seem warranted:

1. Rheumatic heart disease is not uncommon among the aged.
2. The low incidence of childhood rheumatic fever, infrequency of recurrences, prolonged life, and infrequency of death attributable to rheumatic cardiac involvement suggest either an atypical initial

rheumatic infection, or a variant of the classical courses of rheumatic heart disease. That the usual course of rheumatic involvement may not uniformly obtain is suggested by the peculiarities of the syndromes of calcareous aortic stenosis, pure mitral stenosis, and this group.

3. In the extremely aged the absence of marked cardiac enlargement and the maintenance of a sinus mechanism may well have been significant factors in the attainment of advanced age. If these cases are an atypical form of rheumatic disease, it is assumed that in the earlier years covered by this series there was mixing of these cases with patients having the classical clinical course.
4. An active life for an individual with rheumatic valvular damage, in the absence of cardiac insufficiency or active rheumatism, appears to have no deleterious effect upon the ultimate prognosis.
5. Prolonged periods of congestive failure are seldom seen in the aged patient with chronic rheumatic endocarditis.
6. The added strain of auricular fibrillation, auricular flutter, and paroxysmal tachycardias may result in congestive failure in a previously compensated heart.
7. The diagnosis of mitral stenosis, aortic stenosis, and bacterial endocarditis in the aged depends largely upon the recognition of the possibility of occurrence of these lesions.
8. The diagnosis of aortic stenosis and mitral stenosis is accurate in a high degree of instances on the basis of cardiac auscultation.

The direct relationship between infection and acute bacterial endocarditis, and the relationship of a rheumatic background in both acute and subacute bacterial endocarditis has been stressed. Evidence clearly indicates that prompt attention to minor infections in the aged patient suspected of valvular heart disease is imperative.

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Hazards of Surgery Beyond the Age of Eighty*

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ALMOST INVARIABLY reviews of surgery of the aged have included patients in the age group of 65 or 70 and over. This report covers patients in the extreme age group, 80 years of age or over, during a six-year period, from 1943 to 1948 inclusive, and takes into account only those who were on the general surgery service. Ancillary services such as urology and orthopedics are not included.

As Dublin[1] has pointed out, the actual life span of man has not changed since historical times. The pronounced gain recorded in tables of longevity has been largely concentrated in the earlier years of life. There has been very little change, if any, with respect to diseases of very old age, and it has been impossible to stretch the life span.

If life tables for the United States are studied, it will be seen that very little difference exists proportionally in the number of persons of 80 or above living in the first part of the century and the number at that age living at the present time. In the same way, the expectation of life over and above 80 has undergone extremely little change (Table I). In Table II it

TABLE I
EXPECTATION OF LIFE IN YEARS*

	Males		Females	
Year	Age 70	Age 80	Age 70	Age 80
1901	9.03	5.10	9.59	5.50
1910	8.83	5.09	9.38	5.35
1919-20	9.09	5.19	9.59	5.57
1929-31	8.93	5.09	9.69	5.55
1939	9.03	5.31	9.89	5.50

*Table derived from original death registration states: all of New England, New York, New Jersey, Indiana, Michigan, and Washington, D. C. Slight discrepancy between figures in this table and those in Table II due to fact comparable areas are not covered. After Dublin[1].

will be noted that the average number of years a white male at the age of 80 can expect to live beyond that specific age is 5.27 years and that the expectation of life diminishes until at 90 it is 2.88 years. As noted in Table III approximately 66 per cent of deaths in patients over 80 are due to cardiovascular renal disease. Approximately eight per cent are due to cancer and seven per cent to influenza and pneumonia.

The mortality from surgical procedures can be reduced in patients beyond the age of 80 only by a better understanding of the physiology of the

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TABLE II
COMPLETE EXPECTATION OF LIFE
FROM LIFE TABLE FOR WHITE MALES IN THE U. S. 1929-1931

Age	Expectation in Life in Years*	Age	Expectation in Life in Years*
80	5.27	86	3.71
81	4.97	87	3.49
82	4.69	88	3.27
83	4.43	89	3.07
84	4.18	90	2.88
85	3.94		

*Average number of years lived after age if person survives to specified age. After Dublin[1].

aged with resulting better preoperative and postoperative care. As will be seen from this series, there are few operative procedures too hazardous to consider in this age group if the patient is prepared properly and is managed carefully during the operative and the postoperative period.

TABLE III
PERCENTAGE DISTRIBUTION OF DEATHS

	U. S. 1938			
	Males		Females	
Disease or Condition	Age 80-89	Age 90-99	Age 80-89	Age 90-99
Cardiovascular-renal diseases	66.4	63.1	66.1	62.8
Cancer	8.6	4.9	8.3	4.7
Influenza and pneumonia	6.6	8.6	7.0	8.5
Accidents	4.3	5.7	6.7	8.4
Diabetes	1.3	0.6	1.8	0.6
Tuberculosis	0.4	0.3	0.4	0.2
All other causes	12.4	16.8	9.7	14.8

There were 207 individuals in this series, ten of whom were 90 years of age or over. The age distribution was as follows: 80-84, 150 patients; 85-90, 47 patients; 90 or over, ten patients. Of these, 135 were males and 72 were females. A total of 227 operations were performed on this group, with an overall mortality of 45 deaths or 21.7 per cent. If it is calculated upon the total number of operative procedures performed rather than upon the number of individuals the mortality is 19.8 per cent. Seventeen patients had multiple operations performed while in the hospital and in this group there were four deaths or 23.5 per cent. The most common cause of death was pneumonia, pulmonary embolus, cardiac failure, or peritonitis. In nearly all instances, a general anesthetic was given, sometimes supplemented with local anesthesia. In a few instances, a spinal anesthetic was used. A list of the operative procedures performed is tabulated in Table IV. Tables V and VI list the mortality for each year together with the number of surgical cases in that period, the operative procedure which ended in death, and the cause of death when known. The mortality rate in 1943 was 18.6 per cent; in 1944, 30 per cent; in 1945, 35.8 per cent; in 1946, 16.6 per cent; in 1947, 13.8 per cent; and in 1948, 15.3 per cent. Surgery was performed by both residents and staff. It is impossible to find in the literature a comparable series in which the operative procedures are limited to patients 80 years of age or over.

TABLE IV
LIST OF OPERATIVE PROCEDURES

Operative Procedures	*Number*	*Operative Procedures*	*Number*
Supracondylar amputation	35	Closure of evisceration	2
Internal fixation with nail	24	Secondary closure of amputation stump	2
Internal fixation with plate	21	Reamputation	1
Excision and skin graft	14	Forearm amputation	1
Hernioplasty	9	Cholecystectomy	1
Abdominoperineal resection	8	Excision of bone spur on amputation stump	1
Leg amputation	8	Toe amputation	1
Colostomy	8	Cholecystogastrostomy	1
Simple mastectomy	6	Excision carcinoma of parotid	1
Exploratory laparotomy for carcinoma	6	Excision of rectal polyp	1
Local excision of tumor of skin	5	Reduction of volvulus	1
Radical mastectomy	4	Open reduction of femur	1
Incision and drainage	4	Gastrostomy	1
V-excision of lip	3	Cholecystojejunostomy	1
Gastrojejunostomy	3	Suboccipital craniotomy	1
Plastic excision of lip	3	Gastric resection	1
Hemicolectomy	3	Lumbar sympathectomy	1
Skin graft	3	Plastic on anus	1
Finger amputation	3	Inguinal node dissection	1
Colostomy closure	3	Closure necrotic area in cecum	1
Hemorrhoidectomy	3	Osteotomy of hip	1
Freeing adhesions of bowel	2	Closure of cecostomy	1
Debridement	2	Replacement of T-tube	1
Excision metastatic node of neck	2	Saphenous vein ligation for thrombophlebitis	1
Small bowel resection	2	Repair rectal prolapse	1
Suprahyoid dissection	2	Prefrontal lobotomy	1
Mikulicz resection of colon	2	Drainage subdural hematoma	1
Cholecystectomy and choledochostomy	2	Transthoracic diaphragmatic hernia repair	1
Cecostomy	2	Repair pharyngeal diverticulum	1
Open reduction patella	2	Retrogasserian neurectomy	1
		Thigh amputation	1

PREOPERATIVE AND POSTOPERATIVE CARE

IF THERE IS NO EMERGENCY, time is taken to ensure that the patient is properly hydrated and that his blood volume and protein reserves are adequate. Frequently this means repeated transfusions. The patient is encouraged to eat a well rounded diet supplemented with vitamins. If he complains of a poor appetite, whiskey is given before meals. If an adequate food intake does not ensue, it is not too unusual to provide supplementary formula feeding of high protein and calorific value. (One of the simplest and most effective supplements is made by dissolving 30 gm. of skimmed milk powder in a glass of skimmed milk which provides 18 gm. of protein and 26 gm. of carbohydrate. Four glasses a day will result in a beneficial increase in total protein and calorific intake. This mixture may be flavored with chocolate or vanilla. It is recommended that a beater or Waring blender be used to insure

TABLE V
MORTALITY BY YEARS

1943	1944	1945
27 Cases	30 Cases	39 Cases
5 Deaths	9 Deaths	14 Deaths
18.6% Mortality	30.0% Mortality	35.8% Mortality
1946	1947	1948
36 Cases	36 Cases	39 Cases
6 Deaths	5 Deaths	6 Deaths
16.6% Mortality	13.8% Mortality	15.3% Mortality

TABLE VI

Diagnosis	*Operative Procedure*	*Cause of Death*
	1943	
Carcinoma of rectum with metastases	Colostomy	MI?
Carcinoma of stomach with metastases	Exploratory laparotomy	PN*
Burns of body	Debridement	Shock?
Fractured hip	Internal fixation	PN?
Carcinoma of rectum	Abdominoperineal resection	PE*
	1944	
Carcinoma of stomach with metastases	Gastroenterostomy	PN?
Fracture of femoral neck	Internal fixation with nail	PN?
Fracture of femoral neck	Internal fixation with nail	Decubiti; PN?
Carcinoma of colon	Right hemicolectomy	Diabetes; PN?
Arteriosclerotic gangrene	Thigh amputation	PE*
Arteriosclerotic gangrene	Supracondylar amputation	PN?
Intestinal obstruction	Cecostomy	Diabetes; PN?
Bilateral leg gangrene	Bilateral supracondylar amputation	Decubiti; CF?
Fracture of femur	Internal fixation with plate	PN?
	1945	
Arteriosclerotic gangrene	Supracondylar amputation	CF*
Arteriosclerotic gangrene	Supracondylar amputation	Pul. edema?
Arteriosclerotic gangrene	Supracondylar amputation	PE*
Arteriosclerotic gangrene	Supracondylar amputation	CF*
Arteriosclerotic gangrene	Supracondylar amputation	PN?
Strangulated hernia	Exploratory laparotomy, imbrication necrotic area of cecum	Peritonitis*
Carcinoma of rectosigmoid	Colostomy	Diabetes; uremia*
Carcinoma of neck	Excision and graft	Atelectasis; PN?
Scar of leg	Excision and graft	Atelectasis; MI*
Fracture of femur	Internal fixation with plate	CF*
Recurrent carcinoma of sigmoid	Exploratory laparotomy and ileostomy	PN?
Fracture of hip	Internal fixation with nail	Atelectasis; PN?
Fracture of neck of femur	Internal fixation with nail	PN; CF*
Fracture of femur	Osteotomy	CF?
	1946	
Fracture of femur	Internal fixation with nail	PE*
Arteriosclerotic gangrene	Supracondylar amputation	PE; MI*
Gangrene of leg	Leg amputation; supracondylar amputation	Decubiti; wound infection; PN?
Fracture of femur	Internal fixation with plate	PN*
Carcinoma of colon	Exploratory laparotomy; biopsy	Acute gastric dilatation?
Cholecystitis and cholelithiasis	Cholecystectomy, choledochostomy; replace T-tube, close evisceration	Peritonitis*
	1947	
Fracture of neck of femur	Internal fixation with nail	PE?
Fracture of neck of femur	Internal fixation with nail	PE*
Tic douloureux	Suboccipital craniotomy	Cerebral edema?
Fracture of femur	Internal fixation with plate	Cerebral hemorrhage?
Gangrene of leg	Supracondylar amputation	MI; PN*
	1948	
Gangrene both feet	Bilateral supracondylar amputation	Shock
Fractured hip	Internal fixation with nail	PN; Carcinoma of prostate with metastases*
Gangrene of leg	Supracondylar amputation	Cerebral hemorrhage?
Fractured hip	Internal fixation with plate	PE?
Intestinal obstruction	Bowel resection; closure of evisceration	MI*
Gangrene of leg	Supracondylar amputation	PE*

*Indicates postmortem

Symbols: PN—Pneumonia PE—Pulmonary embolus
MI—Myocardial infarct CF—Cardiac failure

thorough mixing.) If the patient does not take the formula feedings voluntarily, a few days of feeding through an indwelling gastric tube often results in a marked improvement in general physical status. This may be the result of the increased caloric intake of the feedings or because the annoyance of the tube induces the patient to eat voluntarily. Often these individuals have no will to live. They feel the situation is hopeless and want to be left alone to die in peace. This mental state may be the result of the poor nutritional status into which they have fallen, and a general nutritional improvement often reverses their mental outlook. Gentleness and courteous encouragement is of great importance in the care of these patients.

If it is impossible to feed the patient by mouth, parenteral feedings are necessary. Fluid administered intravenously must be given very slowly to avoid overloading the circulation. Water and a portion of the nutritional requirements can be supplied by means of protein hydrolysates given subcutaneously. One thousand cc. per day will provide about 400 calories. If this is supplemented with intravenous alcohol, the daily calorific requirement can be met almost completely so that further loss of the patient's residual protein stores will be kept at a minimum.

THESE elderly people are extremely susceptible to large amounts of salt. While the patient is maintained on parenteral fluids, the maximum amount of salt permitted daily is five gm. unless there is need for replacement of a definite sodium chloride loss. If this is not done, edema may develop rapidly and unexpectedly. Furthermore, unless the patient is definitely dehydrated, he rarely requires more than 1000 cc. of fluid a day. Administration of more than 1800 cc. a day intravenously may prove hazardous, since the geriatric patient has a lowered metabolism, eliminates fewer waste products, and therefore requires much less fluid daily than a younger person.

The patient is not permitted to remain constantly recumbent. If he is able, he is urged to go to the bathroom, walk about the ward, etc. His cardiac and kidney status must be evaluated constantly and, if necessary, digitalization accomplished. If azotemia is present, it must be overcome prior to surgery.

If the patient is acutely ill, time must still be taken to overcome dehydration and shock preoperatively because such a patient is especially susceptible to shock. It is foolish and hazardous to undertake, for instance, any major surgery such as that for intestinal obstruction, before the dehydration and/or shock is corrected. If not, it can be expected that the patient will die on the operating table or shortly thereafter.

The choice of anesthetic agent and the technic and management of anesthesia in very old patients are based upon the same fundamentals governing the conduct of anesthesia in patients of any age. It is essential that there be constant vigilance, early recognition of changes in the patient's condition, and prompt, judicious therapy.

Prior to anesthesia patients are evaluated critically as to their physical status. The anesthetic agent or technic or combination of drugs and methods

is selected which provides the desired operating conditions with minimal derangement of physiologic processes and maximal comfort to the patient. There should be no hesitancy in abandoning the preselected anesthetic if the physical state of the patient or the requirements of the operative procedure lead the surgeon and anesthesiologist to believe that change is advisable. This flexibility is an important factor in the management of anesthesia in the elderly patient whose physiologic mechanisms are more rigid and lacking in reserve than those of the younger patient. Extensive literature to the contrary, there is no single ideal anesthetic, general or local, for the patient of advanced age.

In the management of the anesthetic, it is imperative that wide swings in depth of anesthesia be avoided and prolonged deep anesthesia not be permitted. In this regard, it should be remembered that patients in this age group are less tolerant to depressant drugs of all types, sedative, analgesic, or anesthetic. Diminished pulmonary ventilation with its attendant hypoxia and hypercapnia are avoided, and close attention is paid to maintenance of the circulation at levels which are normal for that particular patient. More concern is felt for abnormally low pressures than for abnormally high pressures. Oxygenation of the heart and cerebrum is a paramount necessity. Abrupt changes in position are poorly tolerated by the elderly patient.

Except in unusual circumstances, it is incumbent upon the anesthesiologist to have the patient awake, ventilating adequately, and oriented as soon as possible after discontinuance of the anesthetic, preferably in the operating room. Here it will be possible to determine the response of the patient to changes incident to relatively sudden changes in his anatomy, respired atmosphere, position, etc.

During the postoperative period, every effort is made to get these patients out of bed into a chair on the day of operation and several times daily thereafter. They are turned frequently and a minimum of sedation is given. If severe pain is present, morphine or Demerol in very small quantities is administered, but even with the small dosages employed with either of these two drugs it is not too unusual to have wide hallucinatory side effects as are seen commonly with the barbiturates. The use of analgesic drugs can be avoided in many patients, particularly those with upper abdominal operation, by relieving pain with intercostal nerve block.

If a Levin tube is present in the stomach for gastric suction, it is removed as soon as possible for it produces an inhibitory effect on coughing and increases the amount of mucous secretion, leading to atelectasis and subsequent pneumonia. In addition it may produce ulceration which interferes with early resumption of oral feeding. The great dangers of indwelling tubes must never be forgotten. Oral intake is encouraged as soon as possible, supplemented with vitamins. Again every effort is made to keep the parenteral saline intake at a minimum for fear of the possible edema it may produce and its inevitable fatal complications.

During the immediate postoperative period, frequent checks are made of the blood pressure and pulse. The loss of a small quantity of blood is very serious in these people because the vasomotor system is less capable of compensating and the heart is unable to increase its rate and output as in a younger individual. Therefore hypotension with its subsequent dangers of thrombosis or irreversible shock is avoided at all costs.

Penicillin is given routinely to prevent infective pulmonary complications. It is our feeling that the antibiotics have played a major role in reducing the operative mortality in this elderly group.

DISCUSSION

From the data cited it appears that few if any necessary operative procedures should be refused an individual in the extreme age group. With attention to the details outlined, a satisfactory result can usually be expected. If it is recalled that a patient who has lived to 80 years of age has over five years of life expectancy and at 90 almost three years, it is evident that every effort must be made to treat these patients and that they should not be permitted to die because they are thought to be too old to withstand surgery. The fall in mortality rate which occurred in the six-year period reviewed is undoubtedly due to improvements in all phases of surgery and also to the antibiotics which have helped to overcome the hazard of pneumonia and local infections. However, the fact that the mortality rate has fallen during this period does not permit reckless and careless handling of the extreme aged. After reviewing the cases in which death occurred, it is obvious that in some the patient's interest would have been better served if the operation had been postponed until the patient was in better general condition, or in others, if the operation had been staged.

SUMMARY

1. General surgical procedures performed on patients 80 years of age and over during a six-year period, 1943 to 1948 inclusive, have been reviewed.

2. The overall mortality was 21.7 per cent and in the six years covered the mortality has fallen to 15.3 per cent.

3. Elective procedures should not be performed in this age group. However, necessary surgical procedures should not be withheld because of age. In spite of the greater hazard associated with surgery in the extreme aged, we feel that the operative mortality is now low enough to justify the attitude that age per se is not a contraindication to necessary surgery.

4. The key to improved results lies in a recognition of physiologic deficiencies, judicious correction of these deficiencies by adequate preparation, and careful management in the operative and postoperative period.

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Paroxysmal Arrhythmias: a Psychosomatic Study*

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PAROXYSMAL arrhythmias occurring in young individuals with apparently normal hearts have been frequently thought to be related to emotional disturbances.[1, 4, 5, 7, 10] In the older patient, in whom coronary sclerosis may be suspected, or in the presence of demonstrable heart disease, however, any abnormality of rhythm is commonly attributed to the structural defect alone, and little attention has been directed to the possible role of emotional disturbances. That such a conclusion may not be justified is suggested by the statistical study of Kissane and coworkers[6] which demonstrated no correlation between supraventricular paroxysmal tachycardia and either arteriosclerotic or hypertensive heart disease. It seems reasonable that if paroxysmal arrhythmias occur in structurally normal hearts as part of the reaction to stressful life situations that they should be equally if not more likely to occur in damaged hearts under similar circumstances. In order to investigate this relation between life stress, emotions, and paroxysmal arrhythmias in patients both with and without heart disease a study was made of 26 unselected cases from the wards and out-patient clinic of the New York Hospital.[2] Of the patients included in the study, 15 showed as their sole or principal arrhythmia paroxysmal auricular tachycardia or paroxysmal auriculoventricular nodal tachycardia, and 11, paroxysmal auricular fibrillation. Several had various arrhythmias at different times.

IN EACH case a detailed history was obtained and complete physical examination, electrocardiogram, x-ray of the chest, and other indicated diagnostic procedures performed. Thirteen of the 26 patients were found to have some degree of structural heart disease of various etiologies, including rheumatic, arteriosclerotic, hypertensive and congenital (Tables I and II). In the remaining 13 there was no evidence of structural heart disease. The patients were seen at frequent intervals for periods of time varying from a few weeks up to 18 months. During these clinic visits a psychiatric evaluation was made and events in the daily life situation were correlated with attitudes, behavior, emotional responses, and cardiac symptoms and findings. In order to evaluate the relationship, if any, between life situations, emotions,

*Read at the sixth annual meeting of the American Geriatrics Society, Atlantic City, June 3, 1949.

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and the arrhythmias the answers to three questions were sought: (1) Do the individuals who develop paroxysmal arrhythmias have any common personality traits? Is there a specific personality pattern or sphere of emotional conflict with which the arrhythmias are associated? (2) Is there a temporal relationship between stressful life situations, emotional disturbances, and the occurrence of the arrhythmias? If so, are the stress and the resulting feeling state of any particular kind? (3) Can the arrhythmias be modified by procedures directed at alteration of the emotional state? Can an episode of arrhythmia be induced by manipulation of the emotional state, or, can the frequency of attacks be diminished by the resolution of some of the patient's emotional conflicts?

RESULTS

Personality traits:

While the personalities of the patients did not fit into any specific and invariable pattern certain traits did occur significantly often in the group. A tabulation of these personality traits is given in Tables I and II.

Anxiety. Long standing and pronounced anxiety was a prominent trait of 18 of the 26 patients. They described themselves as "tense and nervous," "worrisome," and "too emotional." In many the origins of the anxiety could be traced to childhood, and as children they had been shy, timid, and lacking in aggressiveness, though sometimes stubborn. With the development of the arrhythmia a previously diffuse anxiety often became focused on the heart, with a conviction of serious heart disease, apprehension of impending sudden death, and intense fear during an attack. Somatic manifestations of

TABLE I

PAROXYSMAL AURICULAR AND AURICULO-VENTRICULAR NODAL TACHYCARDIA: PERSONALITY TRAITS*

Case	Age	Sex	Structural Heart Disease	PERSONALITY TRAITS				
				Chronic Anxiety	Excessive Hostility	Inadequate Expression of Hostility	Compulsive Traits	Subject To Depression
1	42	F	○	+	○	+	+	+
2	43	F	○	○	+	○	+	+
3	32	M	○	+	+	+	+	○
4	33	F	○	+	+	○	+	+
5	61	M	○	○	+	+	+	+
6	35	F	○	+	+	+	+	+
7	51	M	ART'SCL.	+			+	+
8	48	M	ART'SCL.	+	+	+	+	+
9	45	F	RHEUMATIC	+	+	+	+	+
10	61	M	CONG. & ART'SCL.	+	+	+	+	+
11	37	F	RHEUMATIC	+	+	○	+	+
12	47	F	RHEUMATIC	+	○	○	+	+
13	38	M	MYOCARDITIS (?)					
14	24	F	○		+	+	+	+
15	50	M	○	+	○	+	+	+
15			7	11	10	9	14	13

*The blanks indicate inadequate information for evaluation.

TABLE II

PAROXYSMAL AURICULAR FIBRILLATION: PERSONALITY TRAITS*

Case	Age	Sex	Structural Heart Disease	PERSONALITY TRAITS				
				Chronic Anxiety	Excessive Hostility	Inadequate Expression of Hostility	Comp'sive Traits	Subject To Depression
16	40	M	O	+	+	+	O	+
17	28	M	O		+	O	+	+
18	53	F	HYPERTENSIVE	+	+	+	+	+
19	64	F	HYPERTENSIVE & RHEUM.	+	+	+	O	+
20	34	F	RHEUMATIC	+	+	+	+	+
21	65	F	O	+			+	O
22	74	F	ART'SCL.	O	+	O	O	+
23	53	F	O		+	O		
24	55	M	ART'SCL.	O	+	O		O
25	63	M	O	+	+	+		+
26	34	F	HYPERTHYROID	+	+	+	+	+
11			6	7	10	6	5	8

*The blanks indicate inadequate information for evaluation.

anxiety such as palmar sweating, cracked voice, purposeless movements, tremor and exaggerated startle were frequently noted, and 15 of the patients showed sustained sinus tachycardia (heart rate over 80 per minute) upon repeated examination.

Hostility. An unusual degree of hostility was detected in 20 of the 26 patients. Rarely they were irritable and openly hostile. More often, because of a need for approval and support, they repressed or suppressed the hostility and were superficially pleasant and agreeable. This inability to give adequate expression to hostile feelings was a prominent trait of 15 of the patients. It was revealed by their behavior and by such remarks as, "I'm not a person to talk back, I just can't do that." Rather there was a tendency to accumulate resentment within, and this after a period of mounting tension would culminate in an arrhythmia.

Compulsive Traits. Some degree of compulsive behavior was displayed by 19 of the patients. The manifestations varied from anxiety over untidiness in the house to purposeless repetitive acts and thoughts. The patients were, in general, serious, conscientious people given to worrying, excessive planning and rumination. They were meticulous and perfectionistic workers with great interest in detail. They tended to be inflexible and were intolerant of any interference with the order of their lives.

Depression. In keeping with the above personality traits was the common occurrence of depression in this group of individuals. All but five of the patients gave histories of significant periods of depression.

Life stress and arrhythmias:

In evaluating the temporal correlation between life stress and the occurrence of arrhythmias all possible factors in precipitating the arrhythmias

were investigated. Inquiry was made into the relation of the attacks to exercise, infection, fatigue, smoking, drugs, alcohol and coffee, as well as to the life situation. While several of these factors seemed to be implicated in isolated instances only the latter showed a consistent correlation. In every patient a relationship was found between life stress and the majority of the episodes of arrhythmia. In response to the stresses of the environment the patients developed sustained anxiety, resentment, tension and depression, and during such periods they had frequent arrhythmias. The individual attacks might or might not be related to some immediate change in the life situation. Not infrequently the stress was reflected in an increased susceptibility to precipitating factors of a physical nature, such as tripping, sneezing or abrupt change in posture. During periods of security and relaxation the patients could receive these same stimuli without the occurrence of arrhythmias. The emotional states with which the arrhythmias were associated are tabulated in Tables III and IV. The following case history illustrates the relationship between life situations, emotions, and paroxysmal tachycardia.

A 48-year-old Italian tailor (Case 8 in Tables I and III) had had paroxysmal tachycardia for 13 years, angina pectoris for eight and intermittent claudication for three years. Examination showed a pulse rate of 82, blood pressure of 152/86, and heart normal to auscultation. The pulses in the left leg were absent. X-ray of the chest showed slight general fullness of the cardiac silhouette, prominence of the aortic knob, and tortuosity of the aorta. The electrocardiogram following exercise showed changes indicating coronary artery disease.

TABLE III

PAROXYSMAL AURICULAR AND AURICULO-VENTRICULAR NODAL TACHYCARDIA: RELATION TO LIFE STRESS AND EMOTIONAL STATE*

Case	Age	Sex	Structural Heart Disease	Correlation Btwn. Life Stress, Emo. & Arrhyth-mias	EMOTIONAL STATES Associated With Arrhythmias			Arrhythmia Modified
					Anxiety	Resent-ment	Depression	
1	42	F	○	+	○	+	+	
2	43	F	○	+	+	+	+	
3	32	M	○	+	+	+	○	
4	33	F	○	+	+	+	+	+
5	61	M	○	+	○	+	+	○
6	35	F	○	+	+	○	+	
7	51	M	ART'SCL.	+	+		○	
8	48	M	ART'SCL.	+	+	+	○	+
9	45	F	RHEUMATIC	+	+	+	+	
10	61	M	CONG. & ART'SCL.	+	+	+	○	+
11	37	F	RHEUMATIC	+	+	+	○	+
12	47	F	RHEUMATIC	+	+		+	
13	38	M	MYOCARDITIS (?)	+		+		
14	24	F	○	+	+	+	+	+
15	50	M	○	+	+	○	○	+
15			7	15	12	11	8	6

*The blanks indicate inadequate information for evaluation.

TABLE IV

PAROXYSMAL AURICULAR FIBRILLATION: RELATION TO LIFE STRESS AND EMOTIONAL STATE*

Case	Age	Sex	Structural Heart Disease	Correlation Btwn. Life Stress, Emo. & Arrhyth-mias	EMOTIONAL STATES Associated With Arrhythmias			Arrhyth-mia Modified
					Anxiety	Resent-ment	Depression	
16	40	M	○	+	+	+	○	○
17	28	M	○	+	+	+	+	+
18	53	F	HYPERTENSIVE	+	+			
19	64	F	HYPERTENSIVE & RHEUM.	+	+	+	+	+
20	34	F	RHEUMATIC	+	+	○	+	
21	65	F	○	+	○	○	○	
22	74	F	ART'SCL.	+	○	+	+	+
23	53	F	○	+	○	+	+	
24	55	M	ART'SCL.	+	○	+	○	
25	63	M	○	+	+	+	+	
26	34	F	HYPERTHYROID	+	+	○	○	+
11			6	11	7	7	6	4

*The blanks indicate inadequate information for evaluation.

The patient was a tense, anxious, worrisome and rather compulsive person who had difficulty in expressing his frequent hostile feelings. When he was 26 years old, following the death of his first wife, he had a six-month period of agitated depression. At 31 he remarried. His second wife, 13 years his junior, was an anxious and timid person, and not sufficiently neat and orderly to satisfy the patient. She was quite submissive, however, and the patient was relatively happy during the early years of this marriage. At the age of 35 he had a single paroxysm of tachycardia. The relation of arrhythmias to life situation is shown in Figure 1. Four years later the patient was subjected to increasing stress at his job in the clothing industry. He had been promoted to a supervisory position, and felt that the several employees for whom he was responsible were incompetent and uncooperative, but he could not bring himself to criticise or discipline them. For a period of weeks he was aware of progressively increasing frustration and tension until one morning he became so "aggravated" he could no longer tolerate the situation, put on his hat and started out of the shop. It was at this moment that his second attack of tachycardia had its onset.

Several weeks later he developed chest pain and dyspnea suggestive of a myocardial infarction and, on the adyice of his physician, gave up his job. Upon attempting to resume activity after a period of bed rest he discovered that he had angina on exertion. During the ensuing months he was very anxious and apprehensive about his health and finances, and had attacks of tachycardia approximately once a month. By the end of the following year he managed to establish himself in a small confectionery shop which he operated with the assistance of his wife, and during the next three one-half fairly secure years he had only two brief episodes of tachycardia.

When the patient was 44 years old his wife's poor health made it impossible for her to assist him in the store, so he sold the business and returned to a job in the clothing industry. At the same time there was progressive deterioration of his marriage. His wife, previously docile, began to resist his

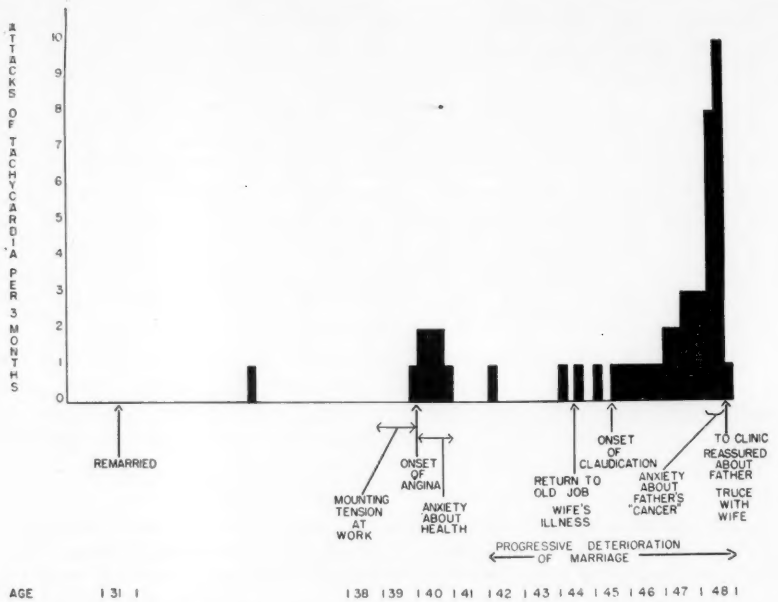

Fig. 1. Relation of Paroxysmal Tachycardia to Life Situation (Case 8).

The number of attacks per three-month period is charted above and important events in the patient's life indicated at the bottom. The frequency of attacks increased during periods of tension and resentment at work, anxiety about his heart, and frustration and resentment incident to marital troubles, and rose to a peak of ten during the three-month period of maximum anxiety about his father's "cancer." In the subsequent three months, following the partial resolution of these problems, only one brief attack occurred.

domination, and each of their frequent arguments left the patient "nervous and sick." Episodes of tachycardia increased in frequency, many of them occurring in relation to quarrels with his wife. Four years later his father developed symptoms which the patient immediately interpreted as indicative of cancer. As his father's illness progressed the patient's anxiety mounted, and the frequency of attacks of tachycardia showed a parallel increase until they were occurring every seven to ten days. The attacks also became increasingly difficult to stop.

During this period an incident occurred which illustrates the roles played by predisposing and precipitating factors in the initiation of an attack of tachycardia. The patient, with his 15-year-old son, was spending a week-end at the home of his uncle in the country. In the course of the evening the uncle rather brusquely ordered the boy to turn off the radio, to which he was listening. The patient reacted with immediate anger but, as usual, said nothing. Instead he went to bed feeling so "aggravated" he was unable to sleep all night. The next day he was still feeling resentful towards his uncle but had grudgingly begun preparations to make some promised electrical repairs when the first of two prolonged attacks of tachycardia had its

onset. This was the only occasion on which he had more than one attack in a single day. The chronic marital strife and anxiety about his father can be considered as predisposing factors which made him particularly susceptible to the immediate precipitating circumstance, the "bottled-up" resentment toward his uncle.

Two months after this incident he made his first visit to the clinic, and a few days thereafter was informed that the tumor removed from his father's neck was not malignant. After the second clinic visit, which had resulted in the patient gaining some insight into the relation of the arrhythmias to his emotional state, he held a discussion with his wife in which a truce was arranged, and although their relationship was not good the arguments stopped. During the three months following these changes he had only one brief paroxysm of tachycardia, and this was readily stopped by the Valsalva maneuver.

Modifiability of the arrhythmias:

The personality features which have been described are by no means specific for patients with paroxysmal arrhythmias, and may be found in many individuals with no such disturbance. However, a consideration of the relation of the arrhythmias to the life situations and emotional states of the patients indicates that the interaction of these particular personality traits and certain stressful life situations is an important factor in the occurrence of the arrhythmias. This conclusion is further substantiated by the success of attempts to modify the arrhythmias by procedures directed at alteration of the emotional state of the patient.

In two patients (Cases 10 and 26) episodes of paroxysmal arrhythmia were recorded electrocardiographically during experimental interviews. In these interviews the patients were led into a discussion of pertinent personal problems, particularly those which the history had shown to be related to the occurrence of arrhythmias. During the discussion of these situations the patients abreacted their former feelings of anxiety, resentment or depression, and coincident with the emotional disturbance developed paroxysmal arrhythmias, auricular tachycardia in Case 10 and auricular fibrillation in Case 26. These experimental observations have been reported in detail elsewhere.[2]

THE MANAGEMENT of the patients in the clinic included the administration of the usual pharmacologic remedies such as quinidine and digitalis when the arrhythmias were frequent or prolonged, and likewise the usual methods of arresting individual attacks were applied. The major therapeutic effort, however, was directed towards a modification of those emotional states and (when possible) environmental circumstances which were related to the arrhythmias. This was achieved through a series of clinic visits in which the patient was encouraged to discuss his problems with a sympathetic physician. He was thereby helped to gain an understanding of the real nature of his problems and consequently to deal with them more effectively. In a number of patients such procedures extending over eight to ten interviews were asso-

ciated with improvement. In others more extended and elaborate analyses of emotional development were undertaken.

Infrequent arrhythmias, insufficient periods of observation, or concomitant drug therapies made it difficult to evaluate results in a number of patients. When these are eliminated there remain 12 in whom modification of attitudes or life situations was attempted and results could be evaluated. In ten of these a lessening of psychic tension and an associated diminution in the frequency of the arrhythmias was achieved. The two unresponsive patients both displayed considerable depression and in neither was any significant alteration in emotional state or frequency of arrhythmias accomplished.

DISCUSSION

THE OCCURRENCE of an arrhythmia is related to the product of the susceptibility of the heart and the stress to which it is subjected. Some types of structural disease increase the susceptibility of the heart to disturbances of rhythm, but the role of stress as a contributing factor is not thereby eliminated. Thus the relationship between life situations, emotions, and the occurrence of the arrhythmias was equally apparent in the 13 patients with structural heart disease and in the 13 with no such involvement.

The stress to which the heart is subjected may be of several varieties. The work of the heart is increased by exertion and certain arrhythmias may be brought out by exercise. The work of the heart is also increased during certain emotional states such as anxiety and resentment. At these times the cardiac output may be increased even more than during the usual exertions of everyday life such as stair climbing.[3, 9] Furthermore, the demands on the heart associated with such emotional states are more prolonged, in some persons being habitual. Such cardiac mobilization occurs in situations of stress or threat as a potentially useful part of the physiologic preparation to deal with the threat. When, however, the individual is unable to resolve the situation he remains in a state of perpetual mobilization for emergency. Tension mounts as anxiety and hostility accumulate, and cardiac hyperactivity persists until, in a susceptible individual, it culminates in a paroxysmal arrhythmia.

The increased load on the heart incident to an augmented cardiac output during anxiety and resentment may not be the sole mechanism involved in the relation between emotions and arrhythmias. Stevenson and co-workers[8] have demonstrated significant changes in the configuration of the electrocardiogram, particularly in the T waves, during periods of emotional disturbance. Whether these changes in the repolarization of the heart are related to increased cardiac output, cardiac anoxemia, sympathetic stimulation or other factors is not known. However, they may well be associated with changes in the irritability of the heart which contribute to the occurrence of paroxysmal arrhythmias.

SUMMARY AND CONCLUSIONS

TWENTY-SIX unselected patients with paroxysmal auricular tachycardia, nodal tachycardia or auricular fibrillation showed several common personality traits, namely, chronic anxiety, hostility which was poorly expressed, and various degrees of compulsive behavior. Their episodes of arrhythmia occurred in situations which aroused anxiety, hostility or depression. Ten had diminished frequency of attacks incident to improvement in their emotional states, and in two cases the onset of an attack was observed during a disturbed feeling state produced in an experimental interview.

It is concluded that paroxysmal auricular arrhythmias are often a part of the reaction to a stressful life situation. As such they may in many cases be prevented by a modification of attitudes and emotional states which liberates the individual from the habit of cardiac mobilization, thereby freeing the heart of the prolonged stress of such mobilization. Therapy of this type is within the power of any intelligent physician who is interested in people and will give sufficient time to his patients to permit a sympathetic discussion of their everyday problems and conflicts. Psychiatric consultation may often be desirable, but in general it is better for the patient to be under the care of one physician who can help him to an understanding of his problems as well as prescribe the indicated drug or other therapy.

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Senile Changes in the Histologic Structure of the Thyroid Gland*

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IT IS COMMONLY ACCEPTED that the thyroid gland in old age loses its normal efficiency and that this functional change is paralleled by structural modifications.[1] This belief, however, rests on scattered impressions, and it is felt that an analysis of the microscopic picture of the thyroid gland of elderly subjects is indicated.

MATERIAL AND METHODS

THE MEDICAL HISTORIES and the necropsy protocols of the autopsies performed within a twelve-month period on subjects between the ages of 70 and 90 years were reviewed. Those cases with clinical or morphologic disease of the thyroid gland were discarded. Sections of the glands of the remaining 40 cases were examined microscopically and the results tabulated (Table I).

A control series consisted of 20 consecutive autopsies performed during the same period on individuals from 20 to 40 years and free of primary disease of the thyroid gland. The histologic appearance of these thyroid glands was similarly studied and the results tabulated (Table II).

GENERAL DESCRIPTION

THE HISTOLOGIC STRUCTURE of the thyroid gland in the older age group is almost constantly characterized by four changes not generally seen in the gland of the young adult. One or several of these deviations might be evident, or all four might be present in the same gland. These morphologic variations are:

1. Decrease in the size of the follicles, progressing sometimes to complete obliteration of the follicular structure or to the formation of fields of small acini. This is illustrated in figure 1.
2. Decrease in the amount of colloid with areas either of acini devoid of colloid or containing very pale colloid. This is seen in figures 2 and 4.
3. Atrophy of the glandular epithelium as indicated by flattening of the lining cells and decrease in their size, seen in figure 3.
4. Diffuse increase in the interacinar connective tissue widely separating the acini with the consequent formation of large fibrous fields surrounding scattered glandular islands. This is shown to a marked degree in figure 4.

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†Recipient of a Damon Runyon Clinical Research Fellowship recommended by the Committee on Growth of the National Research Council and administered by the American Cancer Society, Inc.

TABLE I

HISTOLOGIC APPEARANCE OF THYROID—SENILE SERIES

Serial Number	Age	Sex	Cause of Death	Decrease in Size of Follicles*	Atrophy of Epithelium*	Decrease in Colloid*	Increase of Connective Tissue*	Overall Picture*
1	72	M	Pulmonary embolism	Pa	No	Pa	Mi	—
2	87	M	Carcinoma of biliary duct	Di	Mi	Ex	Mi	±
3	75	M	Carcinoma of bronchus	Di	Di	Di	Di	+
4	76	M	Bronchopneumonia	Pa	Pa	Pa	Pa	+
5	71	M	Pulmonary embolus	Ex	Ex	Ex	Ex	+
6	73	F	Gen. arteriosclerosis	Pa	Pa	Pa	Di	+
7	72	F	Adenocarcinoma of colon	Di	Ex	Di	Ex	+
8	73	M	Diffuse carcinomatosis	No	No	No	No	−
9	74	M	Carcinoma of kidney	Pa	Di	Pa	Ex	+
10	70	M	Gen. arteriosclerosis	Pa	Pa	Pa	Pa	+
11	77	M	Gen. arteriosclerosis; hypertension	Di	Ex	Pa	Ex	+
12	74	M	Carcinoma of rectum	Mi	Di	Pa	Pa	+
13	87	F	Carcinoma of rectum	Ex	Ex	Ex	Ex	+
14	80	M	Gen. arteriosclerosis; hypertension	Pa	Pa	Mi	Di	±
15	75	F	Gen. arteriosclerosis; diabetes	Pa	Di	Mi	Ex	+
16	86	M	Carcinoma of urinary bladder	Pa	Di	Pa	Di	+
17	78	M	Prostatectomy (postoperative)	Mi	Di	Mi	Di	±
18	78	F	Rheumatic heart disease	Ex	Di	Mi	Mi	+
19	80	M	Gen. arteriosclerosis; hypertension	Di	Di	Pa	Di	+
20	71	M	Carcinoma of bronchus	Pa	Di	Pa	Di	+
21	80	M	Gen. arteriosclerosis	Pa	Pa	Pa	Di	±
22	82	F	Gen. arteriosclerosis	Pa	Pa	Di	Di	+
23	71	M	Felty's syndrome	Ex	Ex	Di	Di	+
24	78	M	Gen. arteriosclerosis	Di	Di	Di	Di	+
25	76	M	Hypertension	Pa	Pa	Pa	Di	+
26	90	M	Gen. arteriosclerosis	Pa	Pa	Pa	Di	+
27	71	M	Gen. arteriosclerosis; hypertension	Di	Di	Di	Di	+
28	75	M	Carcinoma of the prostate	Di	Di	Di	Di	+
29	83	M	Bronchopneumonia	Mi	Pa	Mi	Di	±
30	77	M	Pulmonary tuberculosis	Ex	Ex	Ex	Di	+
31	74	M	Bronchopneumonia	Mi	Mi	Mi	Pa	−
32	83	F	Gen. arteriosclerosis; hypertension	Di	Di	Di	Pa	+
33	71	M	Bronchopneumonia	Di	Di	Di	Pa	+
34	82	M	Gen. arteriosclerosis	Ex	Di	Di	Ex	+
35	74	M	Bronchopneumonia	Mi	Mi	Mi	Pa	−
36	80	F	Gen. arteriosclerosis; hypertension	Pa	Pa	Pa	Di	+
37	80	F	Generalized arteriosclerosis	Mi	Di	Mi	Pa	±
38	83	M	Gen. arteriosclerosis; hypertension	Pa	Pa	Pa	Pa	+
39	86	F	Rheumatic heart disease	Di	Di	Di	Ex	+
40	76	M	Carcinoma of colon	Pa	Pa	Mi	Di	+

− absent + present ± indefinite

*Di = Diffuse; Pa = Patchy; Ex = Extreme; Mi = Minimal; No = None

A CERTAIN terminology is adopted to indicate the degree to which each change is present: (a) none, (b) minimal, (c) patchy, (d) diffuse, (e) extreme. Minimal changes are discarded in calculating the significant changes. It is also indicated whether the cumulative appearance of each gland is considered typical in this study of the senile thyroid.

The same terminology is used to tabulate the appearance of the thyroids of the younger subjects. In both series age, sex and cause of death of each individual are listed.

RESULTS

THE RESULTS of this study are shown in Tables I and II under the headings described above. It can be seen that in the younger age group the epithelium is normal in 90 per cent of the 40 subjects (18 cases) whereas, in the older group it is significantly atrophic in 87.5 per cent of the 20 thyroids examined (35 cases).

TABLE II

HISTOLOGIC APPEARANCE OF THYROID CONTROL SERIES

Serial Number	Age	Sex	Cause of Death	Decrease in Size of Follicles*	Atrophy of Epithelium*	Decrease in Colloid*	Increase in Connective Tissue*	Overall Picture*
1	40	M	Acute monocytic leukemia	Di	No	Pa	No	±
2	20	M	Teratoma of mediastinum	No	No	No	No	−
3	27	M	Rheumatic pancarditis	No	No	No	No	−
4	29	M	Rheumatoid arthritis	No	No	No	No	−
5	40	F	Endothelioma of spleen	Di	No	Pa	Di	+
6	35	M	Bicuspid aortic valve	No	No	No	No	−
7	40	M	Carcinoma of bronchus	No	No	No	Mi	−
8	37	F	Chronic myeloid leukemia	Pa	Pa	No	Ex	+
9	31	F	Chronic glomerulonephritis	No	No	No	No	−
10	34	M	Carcinoma of ileum	No	No	No	No	−
11	37	M	Acute monocytic leukemia	No	No	No	No	−
12	30	M	Subacute bacterial endocarditis	No	No	No	No	±
13	39	M	Carcinomatosis	No	No	No	No	−
14	35	M	Acute glomerulonephritis	No	No	No	No	−
15	25	M	Rheumatic pancarditis	No	No	No	No	−
16	29	F	Rheumatic pancarditis	No	No	No	No	−
17	34	M	Disseminated lupus erythematosus	Di	No	No	No	±
18	36	F	Disseminated lupus erythematosus	Di	No	Pa	Mi	±
19	26	F	Dysplasia mesenchymal tissue	Di	No	No	Ex	±
20	26	F	Medulloblastoma	No	No	No	No	−

− absent + present ± indefinite

*Di = Diffuse; Pa = Patchy; Ex = Extreme; Mi = Minimal; No = None

The connective tissue in this age group is markedly and diffusely increased in 90 per cent of the individuals considered (36 cases). Only 15 per cent of the younger age group (three cases) display a significant increase of this element. Of these, one suffered from a generalized distrophy of mesenchymal tissues, so that it seems reasonable to presume that the prominence of connective tissue in this thyroid gland might be part of the general condition. Therefore, in this instance the overall picture was considered indefinite.

THE SIZE of the thyroid follicles was significantly decreased in 82.5 per cent of the older individuals (33 cases) and in 15 per cent of these (three cases) obliteration of follicles was marked. In the control series no obliteration was present and the decrease in size involved only 35 per cent of the subjects (seven cases).

The amount of colloid was decreased in 75 per cent of the older individuals (30 cases) and in 10 per cent of them (four cases) it had completely disappeared. In 20 per cent of the controls (four cases) the colloid was patchily diminished (Table III).

TABLE III

STATISTICAL DIFFERENCES IN APPEARANCE OF THYROID

	Not Significant				*Significant*					
	None		*Minimal*		*Patchy*		*Diffuse*		*Extreme*	
	No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*
Senile series:										
Decrease in size of follicles	1	2.5	6	15	16	40	11	27.5	6	15
Atrophy of epithelium	2	5	3	7.5	12	30	17	42.5	6	15
Decrease in colloid	1	2.5	9	22.5	15	37.5	11	27.5	4	10
Increase in connective tissue	1	2.5	3	7.5	9	22.5	19	47.5	8	20
Control series:										
Decrease in size of follicles	13	65	0	0	2	10	5	25	0	0
Atrophy of epithelium	18	90	1	5	1	5	0	0	0	0
Decrease in colloid	16	80	0	0	4	20	0	0	0	0
Increase in connective tissue	13	65	4	20	0	0	1	5	2	10

In the older age group, the four changes interlock into a characteristic picture in 75 per cent of the thyroids examined (30 cases) as contrasted with the overall changes displayed by only 10 per cent of the controls (two cases). Conversely, it was absent in only 10 per cent of the older individuals (four cases) and in 65 per cent of the younger ones (13 cases). An appearance which is not clear cut in either way is present in 25 per cent of the younger individuals and in 15 per cent of the older ones (Table IV).

TABLE IV

OVERALL PICTURE

	Senile series		*Control series*	
	No.	*%*	*No.*	*%*
+	30	75	2	10
±	6	15	5	25
—	4	10	13	65

In order to correlate the results of the overall picture in the two series and to gain an idea of the reliability of the observations, the standard statistical formulas[2]* were applied to the data. From the calculations the accuracy of the findings is found to fall within the acceptable range (60 to 82 per cent). These calculations may be made for each individual change with statistically significant results.

* $t = \frac{x-m}{\sigma}$; $m = np$; $\sigma = npq$; $q = 1-p$, where: m = mean; n = number of cases; p = accuracy; t = 2 (at 95 per cent probability level); x = number of accurate observations; σ = standard deviation.

When the values of our series are substituted, the calculations yield the following results: $p_1 = 0.817$; $p_2 = 0.590$. This means that there is a 95 per cent probability that the accuracy of these findings in a senile thyroid lies between 59 per cent and 82 per cent, which is an acceptable range.

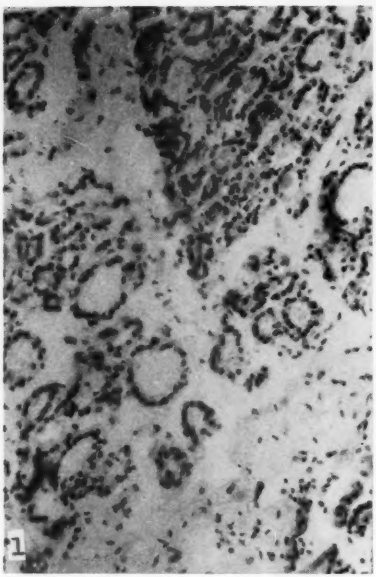

Fig. 1. Decrease in size of acini shown in the upper right. The remainder of the area shows a diffuse increase of fibrous tissue with atrophy of acinar epithelium and loss of colloid. Case 13. 160X. H and E.

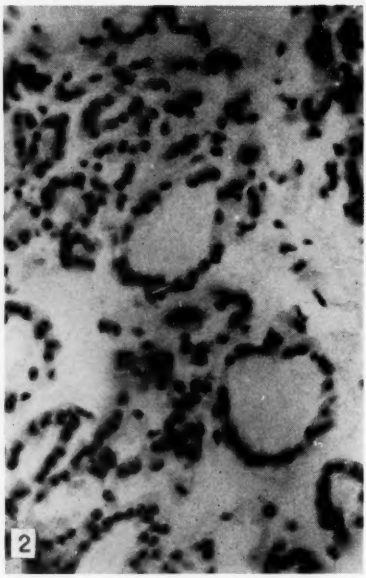

Fig. 2. Another portion of the thyroid gland from the same case. This shows empty acini, lined by flat epithelium and separated by strands of fibrous tissue. In the upper left small acini are seen. 320X. H and E.

DISCUSSION

THIS STUDY indicates that after the age of 70 years the human thyroid gland shows changes in microscopic structure. Similar variations may be seen at an earlier age, but to a lesser degree and much less frequently. These changes are in accord with those described by Cooper.[3] They do not support the observation made by Dogliotti and Nizzi-Nuti[4] who state that the glandular epithelium is not atrophic, and that during senescence the thyroid gland is depleted of its colloid in an effort to compensate for the declining vitality of the whole organism. In the cases studied we noticed only two instances (cases 1 and 2) in which a fairly normal secretory epithelium was associated with a diminution in the colloid content. The other observations reported here fail to confirm their report, since atrophy of follicular epithelium and colloid depletion are seen as co-existing changes.

The microscopic picture we have encountered in the thyroid gland resembles that described in myxedema[5] and induced experimentally[6] in dogs fed desiccated thyroid. This suggests that the reflection of senility on the histologic structure of the thyroid gland may be interpreted either as a physiologic quiescence, secondary to diminished bodily demands for thyroxine, or as one element in the generalized changes that accompany the aging processes of all tissues. This may well represent the histologic parallel of the slow decline in the basal metabolic rate found in advancing age.[1]

Fig. 3. Flattening of epithelium in acini filled with pale colloid or devoid of colloid. Many of the acini are very small or have lost their glandular structure. Case 18. 160X. H and E.

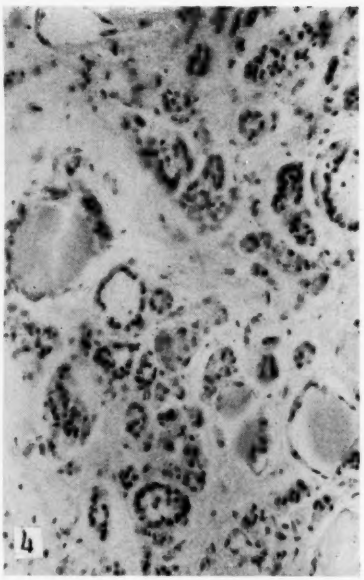

Fig. 4. A severe degree of diffuse atrophy, showing all four types of changes in one field. Case 34. 160X. H and E.

SUMMARY

Four histologic changes are described in the thyroid gland of aged individuals. The resulting picture is characteristic for this age group and its incidence is of statistical significance when compared with the incidence of similar changes in the thyroid glands of young adults. It resembles the appearance described previously in the gland which has become either quiescent after administration of thyroxine or inactive during myxedema. It is therefore suggested that in senility this change represents either a physiologic quiescence secondary to diminished demand for thyroxine, or one aspect of the aging process as it affects the thyroid in conjunction with the rest of the organism.

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Reactions Attributed to Administration of Thiamin Chloride*

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THIAMIN CHLORIDE has been administered, since its synthesis by Williams and Cline in 1936,[1] in increasingly greater quantities and in larger doses, as indications for its use, both therapeutic and experimental, and data concerning its relative harmlessness became available. At first the doses given ranged from one to a few milligrams, and it was with considerable fortitude that ten or more milligrams were used, especially by injection, either intramuscularly or intravenously.

As experience accumulated, the doses were increased on a more or less experimental basis until as much as 500 mg. was given daily by Williams and Spies[2] to normal people for a month without causing objective symptoms. Jolliffe[3] has administered the vitamin to several thousand patients without mishap, and Bicknell and Prescott[4] have given the substance over a period longer than seven years without a case of intolerance developing. The amounts employed as treatment doses for those conditions classified as "therapeutic indications" usually ranged from five to 150 mg.

THERAPEUTIC INDICATIONS FOR USE OF THIAMIN	Treatment Dose
Beriberi (polyneuritic, cardiovascular)	5-150 mg.
Neuritis (alcoholic, gestational, pellagrous)	5- 50 mg.
Anorexia (dietary origin)	3- 10 mg.
To obtain optimal growth	1- 5 mg.
In disorders interfering with assimilation	5- 50 mg.
During periods of heightened metabolism (febrile conditions, hyperthyroidism, vigorous muscular activity)	5- 50 mg.
Pregnancy and lactation	2- 5 mg.

About the same quantities were administered in treating a large group of miscellaneous disorders on an experimental basis, these having nothing to do with a deficiency of the vitamin in the strict sense of the word. Such experimentation has been placed in the category of "other reported uses."

OTHER REPORTED USES FOR THIAMIN (PARTIAL LISTING)

5-150 mg.

- Alcoholic and pellagrous psychoses
- Acrodynia
- Migraine
- Affections of cranial nerves: facial paralysis, nerve deafness, optic neuritis
- Diseases of central nervous system
- Hyperemesis gravidarum
- Thyrotoxicosis
- Relief of pain from "dry socket" following dental extraction
- Roentgen sickness
- Herpes zoster
- Gout
- In surgery
- Ménière's disease
- Trigeminal neuralgia
- Delirium tremens
- Relief of pain: neuromuscular disorders, after tonsillectomy, amputation stumps, varicose ulcers
- Cardiospasm
- Numerous neuritides

*Presented at the sixth annual meeting of the American Geriatrics Society, Atlantic City, New Jersey, June 3, 1949.

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Why some of the latter mentioned conditions respond is not clearly understood, although it is postulated that some pharmacologic and physiologic action takes place over and above the correction of a possible existing deficiency. Thiamin is intimately related to carbohydrate metabolism and in foods and tissues it occurs both in the free form and as thiamin pyrophosphate. It apparently influences the rate of conversion of carbohydrate to fat, acting as a catalyst in pyruvic acid oxidation. Without it carbohydrates may not be metabolized beyond the pyruvic acid stage.

The great variety of symptoms which may result from thiamin deficiency has been summarized by Williams and Spies[2] and Jolliffe.[5] Elvehjem's review article[6] for the A.M.A. Council on Foods and Nutrition, stresses the nutritional importance of these fractions with reference to some of the more lately published facts.

FOR SEVERAL years (1936-1941) no reports appeared in the literature concerning unusual by-effects from clinical use of the material until in 1941, Mills[7] of Cincinnati reported the first death in man following an intramuscular injection of thiamin, and several near fatal collapses. The doses used were from ten to 50 mg. and the reactions seemed definitely allergic in nature. In the one death, an autopsy revealed multiple ecchymoses beneath the pia over both cerebral hemispheres with areas of encephalomalacia and perivascular hemorrhage.

The last report, in 1946, of a death resulting from the parenteral administration of thiamin is by Reingold and Webb.[8] In this article a very excellent review of the literature concerning thiamin sensitivity is given beginning with the Mills' report and ending with their case with autopsy findings. The review is quoted verbatim for the convenience of the reader.

> "Mills (J.A.M.A., 117:1501, 1941) reported the first death in man due to an intramuscular injection of thiamin hydrochloride; at autopsy multiple ecchymoses beneath the pia over both cerebral hemispheres, with areas of encephalomalacia and perivascular hemorrhages, were found. Stern (Am. J. Surg., 39:495, 1938) described a case of 'vitamin B_1 poisoning' of a cat in which 20,000 international units of the vitamin were injected via cisternal puncture. In coming out of the anesthesia the animal became very irritable, with rapid respirations and nystagmus, ending in generalized convulsions. The rapid respirations were interrupted by periods of apnea, which occurred about every four minutes; the animal died in fifty minutes.
>
> "Several reactions following the parenteral injections of a solution of thiamin hydrochloride have been observed. Stern found that 15,000 international units [45 mg.] injected into the lumbar subarachnoid space was apt to produce weakness, conjunctivitis, loss of appetite, buzzing in the ears, stiffness of the muscles and slight fever. Steinberg (Am. J. Digest. Dis., 5:680, 1938) noted the development of herpes zoster on the side of the chest in 2 patients who had been given 2,000 international units [6 mg.] of thiamin hydrochloride intravenously weekly for several weeks, and in another who had been given 1,200 international units [3.6 mg.] by mouth

daily for a period of two weeks. Two other patients given parenteral injections complained of nausea and a sense of constriction of the throat. Mills (J.A.M.A., 116:2101, 1941) observed symptoms similar to those of thyroid hyperactivity, namely, fine and coarse muscle tremors, rapid pulse and noticeable nervous hyperirritability, in patients taking thiamin hydrochloride orally over a period of time. Laws (J.A.M.A., 117:176, 1941) reported that a woman was given daily, then weekly, subcutaneous injections of thiamin hydrochloride. After many of these injections, and after leaving the physician's office, she would sneeze violently several times, and the site of injection would itch for several hours. Ten days elapsed before her final injection, after which she developed generalized urticaria, edema of the face, dyspnea, cyanosis and wheezing. Intracutaneous and passive transfer tests indicated that the patient was sensitive to thiamin hydrochloride. Stiles (J. Allergy, 12:507, 1941) observed 2 patients in whom prolonged administration of thiamin hydrochloride produced hypersensitivity to it. One patient complained of nervousness associated with flushing and tachycardia, the other a sensation of heat and profuse perspiration. Schiff's patient (J.A.M.A., 117:609, 1941) collapsed after having received parenteral injections for several months. She had had short bouts of nausea and sneezing after several injections. Intradermal tests indicated that she was sensitive to an aqueous solution of thiamin hydrochloride. Eisenstadt (Minnesota Med., 25:861, 1942) added 2 cases of his own to the literature in which the patients showed allergic reactions to parenteral administration of the vitamin but who were able to tolerate it orally without adverse effects. His patients were positive to the intradermal tests but negative to the passive transfer tests. He suggested, as did Laws, that patients who are about to receive thiamin hydrochloride parenterally should be skin tested as a precautionary measure. One of Leitner's patients (Lancet, 2:474, 1943) developed an asthmatic-like attack with eosinophilia after a long course of parenteral injections; the other had symptoms resembling those of thyroid overdosage. Intradermal tests with thiamin were positive. Stein and Morgenstein (Ann. Int. Med., 20:826, 1944) report that a young man who received large doses of thiamin hydrochloride parenterally (from 15,000 to 30,000 international units) [45 mg. to 90 mg.] at first several days apart, and later at approximately monthly intervals, developed itching and a large wheal at the site of inoculation after each injection. After the last injection he collapsed; he perspired profusely, was dyspneic and cyanotic and had wheezing breath sounds. He recovered the next morning, after stimulants had been given. Later an intradermal test with a saline solution of thiamin hydrochloride was positive."

Autopsy Findings in the Reingold-Webb Case:

"Pathologically, the anaphylaxis probably manifested itself in constriction of the smooth muscles of the pulmonary arteries and bronchioles, resulting in pulmonary engorgement and right heart dilatation and failure, and in mild pulmonary emphysema, respectively. In addition, small foci of polymorphonuclear leukocytes and round cells were seen in thickened septums of pulmonary alveoli. Foci of pigmented macrophages probably indicated that previous hemorrhages had occurred following an anaphylactizing injection."

Over the past 10 years (March 1, 1938, to April 21, 1949), it has been possible for the author to collect a series of reports from all over the United States, relating to reactions following use of thiamin by the parenteral route, usually intravenously, as witnessed by 143 physicians administering the vitamin. These case reports have been summarized, and total at least 179 in number where definite comment was made. An additional 75 physicians have asked in writing for information on the subject in general which might indicate that they had encountered one or more patients who perhaps exhibited by-effects after receiving the material by injection, usually intravenously.

The symptoms exhibited are on the basis of anaphylaxis, the vitamin acting as the anaphylactogen according to Reingold and Webb. The reactions reported to us were mild in some instances and exceptionally severe, bordering on death in other cases. The symptoms include the following reactions, many patients exhibiting two and more side-effects.

REPORTED REACTIONS TO THIAMIN ADMINISTRATION

Agitation
"Allergy"
Angioneurotic edema
"Asthma"
Blood pressure changes—
  rapid fall
  temporary slight fall
  transient rise
Burning—rectum
Chills
Choking
Collapse
Convulsive movements
Coughing
Cramping—abdominal; legs
Cyanosis
Death
Desquamation—mild
Diarrhea
Discharge from nose—
  thin and colorless
"Distress"—general;
  epigastric
Dizziness
Dyspnea
Edema—eyes and lips
Erythema—general; face
Faintness
Fever
Flushing—face and hands
Gas
Gastro-intestinal griping
Headache
"Heart attack"
Herpes zoster
Insomnia
Intraspinally—
  tinnitus
  dizziness
  nausea
  weakness
  conjunctivitis
  temperature elevation
Irritability
Itching—site of injection; rectum; eyes;
  palms; general; extremities; face
Lacrimation
Laryngeal obstruction—
  Partial
Malaise
Nausea
Nervousness
Numbness—extremities
Odorous urine
Pain—increased in some cases of neuritis
Palor
Panic
Perspiration—profuse; cold
Precordial pain
Pulse changes—rapid; thin; thready;
  weak; slow
Pulseless
Rash and desquamation
Respiration
Ringing in ears
Shock (variously described)
Shortness of breath
Skin rash—"nettle-like"
Smothering sensation
Sneezing—mild to violent
Speech loss
Stomachache
Swelling—injection site; eyes
Syncope
Temperature rise
Tenesmus
Tetanic spasm
Tightness in chest
Tingling of extremities
Tinnitus
Trembling
Tremor
Unconsciousness
Urticaria—general; at injection site
Voiding—involuntary
Vomiting—mild to severe
Weakness—generalized
Wheezing—audible

In seventeen instances the difficulty was merely and variously described as "reaction(s); severe reaction; very severe reaction; sensitivity; untoward reaction; severe, anaphylactic-shock-like reaction; serum-sickness-type reaction; shock-like syndrome; 'nitritoid-type reactions'; and systemic reaction."

That patients may develop sensitivity to thiamin, as with other drugs, is a possibility to be borne in mind, particularly if the vitamin has been given a number of times by injection, especially by the intravenous route. Cases of intolerance, as evidenced by any of the symptoms listed, should not receive additional treatment with thiamin by intravenous injection unless they have been desensitized following the usual procedures to accomplish this end. Some patients who exhibit sensitivity when receiving the vitamin intravenously may be able to take it without difficulty if the intramuscular route of administration is used. Likewise, they may be able to take the drug orally without developing side-effects.

IT HAS been proposed that skin testing to determine sensitivity be practiced if a patient has been receiving injections of thiamin and has had a rest period, or an appropriate period of latency, during which time lapse the organism produces antibodies.

In fact, skin testing has been done by Laws[9] who described a case of angioneurotic edema with widespread urticaria following repeated injections of thiamin. A large urticarial wheal surrounded by erythema followed an intradermal test. Schiff[10] and Stiles[11] also report positive reactions following intradermal testing. While these reports are suggestive of sensitization to thiamin hydrochloride, the results cannot be taken as conclusive evidence of such sensitivity in view of the report by Kalz[12] who concludes that thiamin seems to be an obligate wheal producing substance and, therefore, a positive intradermal test with the drug would *not* be conclusive proof of individual sensitivity.

CONCLUSIONS

1. Intolerance to thiamin develops with relative infrequency. This report covers the occurrence of 179 cases, not hitherto reported in the literature, as encountered by 143 physicians over a ten-year period. These physicians were using vitamin B_1 regularly by injection.
2. When individuals have been receiving the drug by injection and have had a rest period from treatment, any future parenteral therapy should be begun with doses considerably lower than those previously given, and the intramuscular rather than the intravenous route employed. If no untoward symptoms develop, the doses gradually may be increased to the level considered adequate for treatment.
3. If *any* of the symptoms listed in Table I develop following an injection of thiamin, next doses should be given with extreme caution or not at all.
4. Sensitive-suspected individuals may be skin-tested in the usual man-

ner, although a positive skin test does not necessarily denote specificity of the test.

5. Desensitization of sensitive persons may be practiced in those in need of the fraction by injection and where a substitute route for intravenous administration especially cannot be found.

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*Blood Volume in the Elderly Surgical Patient**

B. A. Hero, M.D., *and Hugh Barber*, M.D., *New York City*

DEATH FROM pulmonary edema and peripheral vasomotor collapse in elderly surgical patients may be guarded against only by a careful blood volume study. Hematocrit, plasma proteins and circulating plasma volume determinations are indicated for judicial parenteral therapy. The narrow margin of compensatory reserve with which these patients are left leaves no room for correcting the error inherent in crude replacement, as for example, replacement of whole blood when only red cells are required.

Quantitative replacement of the specific fraction needed offers the best hope for success in the poor risk group, both in preparation and maintenance. This replacement may mean infusion of red blood cells, or albumin, or whole blood, or electrolytic solutions.

In a series of 12 elderly pre-operative patients ten had plasma volumes from 43 to 88 per cent of normal. Only three patients had normal concentration of plasma protein, and none had normal volume. All 12 cases presented values for circulating red cell mass below 92 per cent of normal, and one was less than one-third this value.

*Blood volume in the elderly patient before and after surgery. Surgery 27:531, 1950.

The Resection Angulation Operation for Arthritis of the Hip

Henry Milch, M.D., F.A.C.S., F.I.C.S.*

THE PAINFUL, stiff hip is essentially a disease of advancing years. Regardless of the antecedent etiology or the underlying pathology of the condition, patients present the same symptomatology, viz.: pain and inability to flex the thigh. Pain may be the dominant symptom, may be of variable severity and may be present whether weight bearing or not. On the other hand the pain may be relatively mild but the inability to flex the thigh, to put on shoes or stockings, to use the bathroom or to mount a bus step may be so incapacitating as to make life truly miserable. This is especially the case if the opposite hip or the adjacent lumbosacral joint is simultaneously involved.

Except for the angulational osteotomy which may effect temporary relief by altering the line of weight bearing, only two general methods have been devised to control pain. The first and less effective of these is that of neurectomy of the nerves supplying the hip joint. Quite apart from the fact that it is completely ineffectual in a large percentage of cases, it obviously is completely valueless in controlling or even retarding the progressive malformation of the hip joint which leads ultimately to stiffness and loss of flexion.

The second type of procedure, arthrodesis, is altogether a measure of last resort and not at all within the spirit of modern surgery, with its emphasis on functional rehabilitation. It is a highly complicated technical procedure, of which the outcome is by no means assured. Even when successful, it may obviate the pain in the hip, but only at the cost of definitely establishing the symptom complex which arises from stiffness of the hip. Worse even than this is the established fact that in a high percentage of the cases of ankylosis of the hip, intractable pain in the lumbo-sacral joint may confidently be expected. The end of such surgery is the conversion of a patient with a painful, stiff hip into one with a stiff hip and a painful back. The choice does not seem very encouraging in unilaterally affected cases, and in bilateral cases it is clearly prohibitive.

It is for this reason that methods of releasing the hip have been devised with ingenuity which more than equals that employed in its fusion. Unfortunately, the results of such efforts, by whatever method it has been attempted, have been far from gratifying. The fundamental reproach of all these methods is that they are not primarily directed at the underlying pathology. However skillfully the femoral head and even the acetabulum may be remolded, the connective tissue changes and the vascular damage cannot but be made worse by the additional trauma of surgery.

The altered appearance of the hip joint is the result and not the cause of the osteoarthritic manifestations and the restoration of anatomical configuration permits the drawing of no conclusion with respect to reestablishment of function. It is this only which interests the patient. It is toward the accomplishment of this purpose that the resection-angulation is employed.

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In principle, the resection-angulation is a pelvic release operation and no effort is made at anatomical reconstruction. Its sole objective, the reestablishment of function, is achieved in two stages:

1. Resection of the femoral head and neck with resultant restoration of mobility of the femur.
2. Angulation of the upper end of the femur with resultant reestablishment of relatively painless stability.

The significance of each of these stages is self evident and has been established by repeated clinical application. Experience has, however, amply documented the fact that excessive angulation leads to pain as well as limitation of motion. To avoid these undesired sequelae, the angulation of the femoral shaft must be accurately controlled, and should, except for specific indications, never exceed the angular inclination of the side of the pelvis against which the osteotomized femur must rest when the patient is in the erect position.

The inclination of the pelvic wall may be easily estimated from the roentgenogram of the pelvis. (Fig. 1.) A horizontal line is drawn between the acetabular roofs on both sides. Another line is drawn from outermost portion of the ischium to the side of the pelvis, exclusive of the iliac flare. At the point where this oblique line intersects the horizontal line previously drawn, a perpendicular is dropped from the horizontal line. The large angle which this perpendicular line makes with the oblique line has been defined as the angle of pelvic wall inclination.[2] Quite clearly this angle will vary with the degree of inclination of the pelvic wall. In standing, the pelvis will tend to incline downward on the side of weight bearing with consequent increase of the angle on this side, and corresponding decrease on the opposite side. This angle determines the degree to which the distal portion of the osteotomized broomstick femur may be angulated in order to provide adequate support without limitation of motion at the hip.

Since the upper end of the angulated femur must lie against the side of the

RESTORATION OF HIP FUNCTION WITHOUT ANATOMICAL RECONSTRUCTION

1. Mobility achieved by resection of femoral head and neck.
2. Stability achieved by pelvic support osteotomy.

Angulation of femu-postosteotomy angle determined by inclination of pelvic wall.

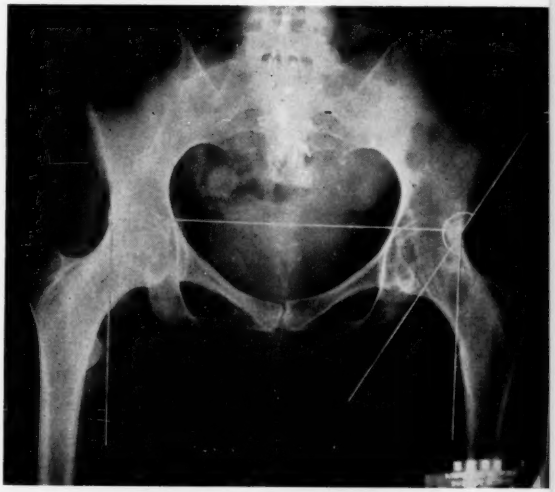


FIG. 1. Inclination of pelvic wall measured by line tangent to pelvis and line perpendicular to interacetabular line.

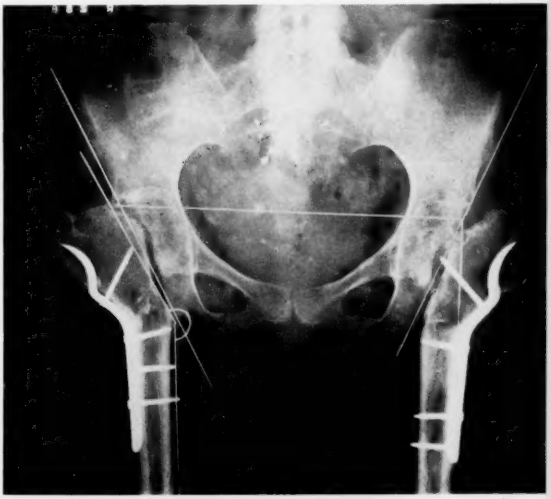


FIG. 2. Postosteotomy angle measured by line drawn from upper end of osteotomized shaft to upper end of proximal fragment and line parallel to femoral shaft. (Courtesy Dr. John Moe.)

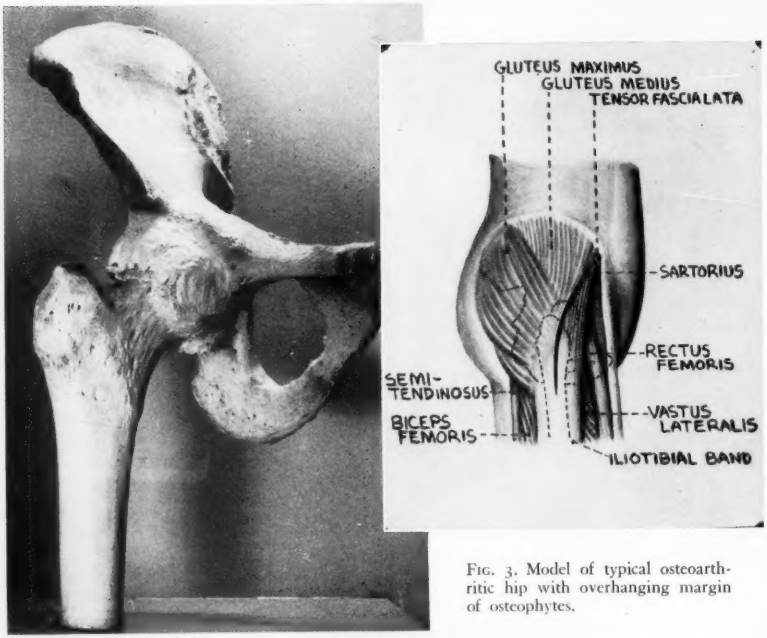


FIG. 3. Model of typical osteoarthritic hip with overhanging margin of osteophytes.

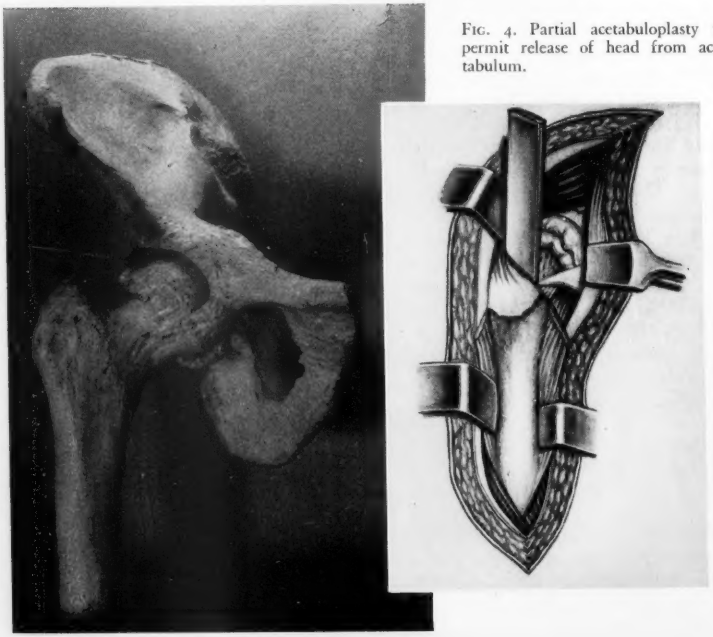


FIG. 4. Partial acetabuloplasty to permit release of head from acetabulum.

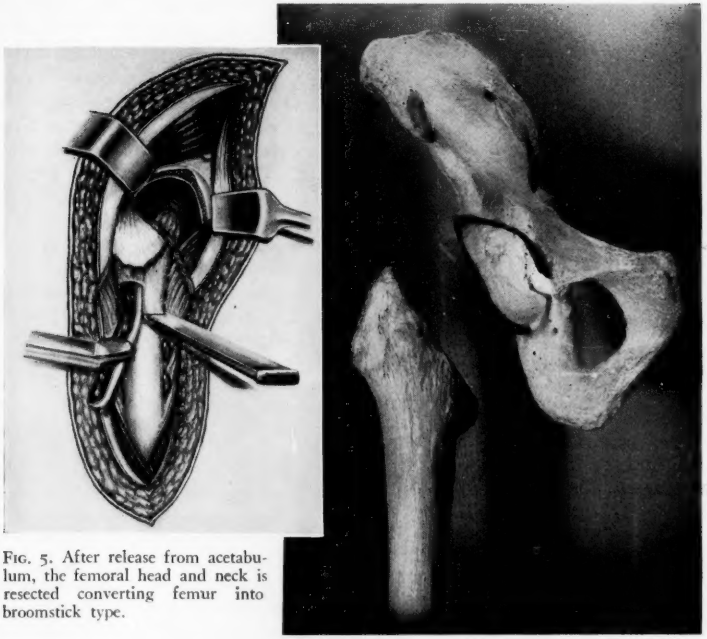


FIG. 5. After release from acetabulum, the femoral head and neck is resected converting femur into broomstick type.

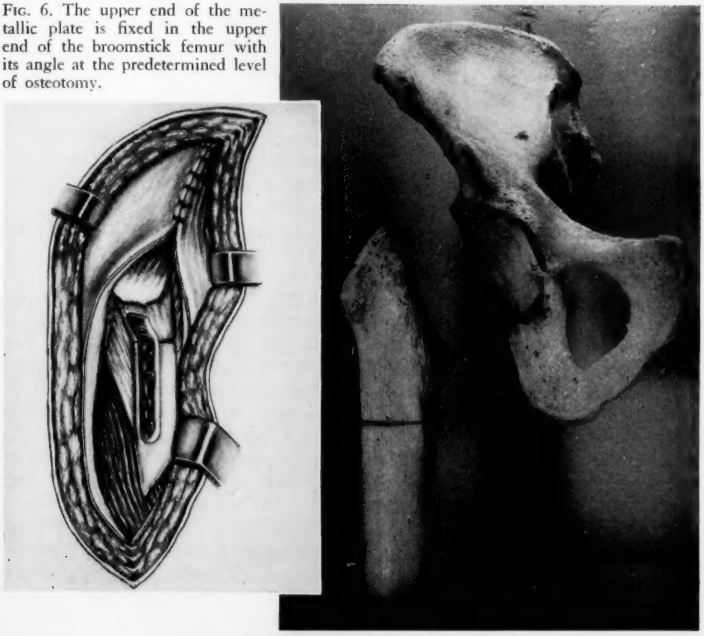


FIG. 6. The upper end of the metallic plate is fixed in the upper end of the broomstick femur with its angle at the predetermined level of osteotomy.

FIG. 7. The femoral shaft has been osteotomized at the predetermined level and the distal portion of the shaft has been abducted and fixed to the angulated plate.

level pelvis, it is apparent that its angulation must be equal to the angle of pelvic inclination. This is determined on the same roentgenogram as is used in the measurement of the angle of pelvic wall inclination. The level at which osteotomy is to be performed is marked on the femoral shaft by a transverse line. (This level is at or slightly below the lowermost level of the ischium on the same side.) From the inner end of this transverse line, a tangent to the base of the resected femoral neck is drawn. Using this tangent as a base, this postosteotomy angle, exactly equal to the previously determined angle of pelvic inclination, is erected. This indicates the degree to which the distal portion of the osteotomized femur must be abducted in order to secure the optimum stability with minimum loss of mobility. (Fig. 2.) Upon the basis of this determination, the plate which is to be used to hold the osteotomized fragments is bent prior to operation.

For this purpose any piece of suitable steel may be used. In practice, it has been found expedient to rebend the Blount-Moore blade-plate so as to correspond to the predetermined post-osteotomy angle. Because of the many variable factors involved, each blade-plate must be individualized for each case.

The operation itself[1] comprises two phases: 1. Resection of femoral head and neck; 2. Angulational osteotomy.

Figure 3, page 282, presents a typical osteoarthritic hip joint with overhanging osteophytes which limit the motion of the head. In figure 4, the overhanging osteophytic rim has been partially resected (partial acetabuloplasty) so as to release the head and permit its dislocation from the acetabulum. In figure 5, the neck has been transected just above the intertrochanteric line. In figure 6, the site of oseotomy has been marked on the femoral shaft and the pre-operatively angulated nail is inserted. In the last figure after osteotomy, the distal portion of the osteotomized shaft has been abducted and fixed to the plate (Fig. 7).

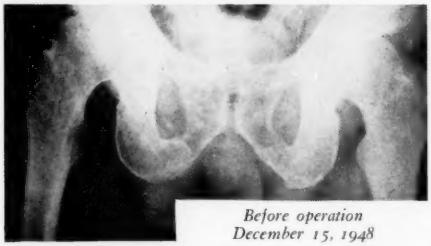
If the operation is undertaken through a lateral ilio-femoral incision (Fig. 3, inset) after retraction of the skin and fascia, the interval between the gluteus medius and tensor fascia femoris is developed and the capsule is exposed. This is opened and the base of the femoral neck transected (Fig. 4, inset). Thereafter the capsulae flaps are sutured over the rough area of the neck and the upper portion of the wound is closed. The incision is extended downward exposing the shaft of the femur. The site of osteotomy is noted and the previously angulated nail is driven into the upper end of the femur (Fig. 5, inset). The femoral shaft is osteotomized, the distal end is abducted and fastened to the steel plate. (Fig. 6, inset.) The fascia and skin are closed without drainage.

As in all other types of arthroplastic procedure, the postoperative care is of utmost importance. No immobilization whatsoever is used and the technique has been further modified so as to permit active and passive mobilization of the limb. Directly after returning from the operating room and even before the patient has reacted from anesthesia, the affected limb is suspended in a balanced sling which enforces flexion on the trunk to more than a right angle. As soon as possible the patient is encouraged to attempt active extension of the leg. Within the first week the patient may be permitted to sit up in bed with his feet resting on a bedside chair. At the end of three weeks, the patient is encouraged to begin weight bearing and walking with the aid of crutches. Thereafter, pool exercises

POSTTRAUMATIC OSTEOARTHRITIS OF RIGHT HIP

Case 1. Gus S., a painter aged 57, had the usual limitations of motion etc., but his chief reason for submitting to operation was pain on standing. This was so severe as to prevent him from working. Within six months after operation, this patient resumed his usual work, completely relieved of pain. The photograph shows the ease with which he can put on his shoes. He was able to hop on the affected leg without any instability and he has not lost a single day since he returned to work.

Before *After*



Before operation
December 15, 1948

After operation
April 1, 1949

and gradually increasing function, including stair walking, are attempted. Normally these patients may be discharged from the hospital about six weeks after operation, and physiotherapy exercises are continued until the patient has regained confidence to walk with assistance of crutch or cane.

The procedure has been employed in osteoarthritis, malum coxae senilis, in ankylosis following infections, epiphyseolysis or surgery, in femoral neck fractures, united or nonunited, where the head has become ischemic or arthritic, in Marie-Strümpel's disease and in cases of arthritis superimposed on old congenital dislocations of the hip. It would seem to have a field of application in all cases where uncontrollable pain or limitation of motion at the hip are the indications for therapy. Within reasonable limits (15-90 years) age does not seem to be a contraindication. Providing blood loss is minimized and replaced by transfusion, shock does not appear to present any difficulty. It avoids the use of immobilizing plaster and reduces to a minimum the period of hospitalization.

Though it appears to run counter to all the previously described operative procedures in that it does not attempt anatomical reconstruction, it has merit in that it actually does resolve the patient's complaints and does restore functions. Of the older group of patients, one has been seen fifteen years after operation without any return of pain or limitation of motion. The group of patients with the newer one-stage operation have been kept under direct observation over periods of time varying up to five years. None has lost any of the mobility which it was possible to restore at operation, none has any loss of stability and none has had any disabling recrudescence of pain. From the patient's point of view, the operation is successful and justifies wider use.

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2. —:The post osteotomy angle. J. Bone and Joint Surg. 26:394, 1944.

Inset figures 3 to 6 published previously in Journal of International College of Surgeons.

GERIATRICS

Official Journal of the
American Geriatrics Society

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Correspondence pertaining to the American Geriatrics Society should be addressed to Dr. Malford W. Thewlis, Secretary, 25 Mechanic Street, Wakefield, Rhode Island.

National Conference on Aging

More than 800 delegates from all parts of the country, representing business, labor, medicine, education, religion, and other interested groups, met in Washington August 13, 14 and 15 for a National Conference of Aging called by Federal Security Administrator Oscar R. Ewing. The conference was called in response to President Truman's request to explore the implications of the steady increase of older persons in our population to the individual, the family, the community and the nation. General objectives of the conference were:

1. To re-evaluate the potentialities of older people toward ensuring their useful and satisfying participation in the life of the community.

2. To stimulate the exchange of ideas among persons of varied experience with a view to solving the problems of the aging through voluntary and public organizations in each state, city and community.

3. To transmit the findings of the conference to interested groups as guide lines for developing policies with regard to older people.

Directed by Clark Tibbitts, assistant chief of the division of public health methods, USPHS, delegates met in ten separate discussion sections, each concentrating on a different aspect of the aging problem. Fourteen prominent experts on various problems of old age served as chairmen of these groups. Sections and their chairmen were:

Aging and Research: Dr. Roy G. Hoskins, director, Memorial Foundation for Neuro-Endocrine Research, Boston.

Population Changes — Social and Economic Implications: Dr. Philip M. Hauser, associate dean, University of Chicago.

Employment and Rehabilitation: Albert J. Abrams, director, New York State Joint Legislative Committee on Aging.

Income Maintenance: Professor Clark Kerr, director, Institute of Industrial Relations, University of California.

Health Maintenance and Services: Dr. Dean W. Roberts, deputy director of health, Maryland State Health Department.

Education for an Aging Population: Dr. Wilma Donahue, director of the program for the aging, Institute for Human Adjustment, University of Michigan.

Family Life, Living Arrangements, and Housing: Co-chairmen: Joseph P. Anderson, executive secretary, American Association of Social Workers; and Dr. Ernest W. Burgess, professor of sociology, University of Chicago.

Creative and Recreational Activities: Mrs. Helen H. Brunot, formerly director of the Bureau for the Aged, Welfare Council of New York City.

Religious Programs and Services: Co-chairmen: Rev. Dr. Beverley M. Boyd, executive secretary of the department of Christian social relations, Federal Council of Churches of Christ in America; Rev. Robert Brown, assistant secretary of the National Council of Catholic Charities; and Rabbi Sidney E. Goldstein of the Stephen Wise Free Synagogue, New York City.

Community Organization: Dr. Herschel W. Nisonger, director, Bureau of Adult Education, Ohio State University.

Professional Personnel: Dr. Aaron J. Brumbaugh, vice-president, American Council on Education, Washington, D. C.

Seven committees working as subdivisions of the health maintenance section covered problems of health promotion; etiology and epidemiology of degenerative diseases; detection, treatment and care of diseases peculiar to old age; care of patients with extreme handicaps and severe impairments of health; rehabilitation; environmental health needs; and community planning for health.

Two approaches to the problem of health promotion were outlined—first, a long-term approach for research and development of information of which there is thus far little known, and second, the short-term approach for utilization of existing facilities for promotion of better health.

No unique epidemiological or etiological aspects of aging were defined. It was concluded that the same essential and basic concepts that are applicable to the population at large should and can be applied to the aging population.

Doctors Disagree

IT WAS probably not Alexander Pope's intention to cast any reflection on the medical profession when, in his *Moral Essays,* he said, "Who shall decide when doctors disagree." The two word abridgement "doctors disagree" might appear to have an unfavorable implication. However, we are inclined to believe that by this statement, Pope only inferred that even teachers and men of learning disagree sometimes. Members of the medical profession will certainly admit this to be the case.

Disagreements arise from differing experiences. That is the chief reason why physicians meet from time to time to recite their experiences and compare notes. From such meetings stems much of our progress in medical science, for doctors are loath to accept statements without confirming proof and each must present evidence to bear out his conclusions. Discussion of observations and disagreements between individuals is necessary in order to reach ultimate agreement.

When Anton Carlson recited his experiments, he often said, "Let us look at the evidence." Sometimes he added, "It is one thing to entertain an idea and quite another matter to let the idea entertain you." It is only through such a cautious attitude in our studies that we arrive at the facts. "Be not the first by whom the new are tried, nor yet the last to lay the old aside" is a wise admonition to be followed in considering an innovation until disagreements have been threshed out and an acceptable proven conclusion reached.

A. E. HEDBACK, M.D.
Editor

*Socio*medical Progress

Devoted to constructive correlation of interrelationships between sociological and medical problems in the aged. . . .

The Family Welfare Agency Community Planning for the Aged*

Amy S. Powell†

NOT LONG AGO a group of eminent medical men, discussing some of the problems involved in our ever increasing number of older people, brought out this point: "Through scientific advance we are able to keep more people living longer; we are now concerned with the fact that longer years are useless unless they bring added enjoyment and satisfaction. Surely the mere lengthening out of a rather barren existence is not living."

The social factors of aging are the joint concern of many disciplines, and in order to meet the basic needs of this segment of our population, our individual services must be integrated with skill and wisdom.

Just how do the services of the family welfare agency fit into the complex needs of the older person, and what is its unique contribution to this over-all helping process? Private family agencies throughout the country are concerned with everything that makes for sound family living and the best possible adjustment of the individual to his own personal problems, his relationships with others and with the community. In the Family Society of Greater Boston, we have had for over 25 years a specialized department working primarily with the older person, his needs and problems. In the beginning, our main function was to act as a beneficent, protecting parent to the aged person, making the incline to the grave less steep and ominous. That was a long time ago. We are now chiefly concerned with the participation in living and the joy of achievement still possible for those in late maturity. We are well aware of the obstacles involved in this goal. There are many counts against the older person, physically, economically, and socially, but while we strive to do what we can to lessen strains and stresses in these areas, we know that in spite of them the older person often has many latent strengths on which to build a more satisfying life adjustment. To discover these strengths, however, we must know something of the total personality structure of the aged person, his environmental and emotional background, how he has reacted to difficulties in the past, and his ability to relate to other people. This knowledge of the older individual must be something much more than mere intellectual understanding, something partially ex-

*Read at the seventh annual meeting, American Geriatrics Society, June 3, 1950, New York City.

†Director, Department for Older Persons, Family Society of Greater Boston.

pressed by the word "empathy," a feeling with rather than about him. Older people often seem peculiarly sensitive to the emotional tone of our contacts with them, and are quick to detect and resent coldness and indifference even though carefully concealed.

Old age is often rife with complaints. Some of them are patent bids for attention and sympathy, but many of them may have a sound basis. To be of real service, we must sift these complaints and determine their validity. This usually involves seeking competent medical advice.

In addition to the usual hospital clinic, which is sometimes too exhausting and confusing for the very frail older client, our agency is fortunate in having available for consultation and advice skillful general medical men who are particularly interested, sympathetic and optimistic in their approach to the problems involved in the aging process. This close cooperation has been invaluable in helping us determine what can be done medically for our clients, and in what areas we may work with them safely.

In order to show the manner in which the family agency functions for older persons, several case histories are cited. The first case illustrates the agency's role in trying to help a woman suffering from an incapacitating illness.

Mrs. H., aged 61, divorced, a former saleswoman, applied to the agency and was referred to the department for older persons. She had been ill with heart trouble for about six months, and during that time she had depleted her savings to meet living expenses and the cost of medical care. She had moved several times to less expensive living quarters until at the time of application she was living in a $5.00 a week room in a lodging house. She was the last surviving member of her immediate family and had no other close relatives.

The social worker first arranged for her immediate basic needs of rent and food, and took the client to a hospital clinic for medical evaluation. Since her condition precluded any hope for immediate employment, she made application for public assistance. The family agency provided financial help until her eligibility for public aid was established. After six months her needs were re-evaluated, and a medical examination revealed that she was still unable to work. Worker and client outlined her needs in budgetary form, including rent, food, carfare to clinic, insurance (especially important to older clients), dry cleaning, shoe repairs, personal needs, etc. Money was obtained from a trust fund to supplement public assistance over a 10-week period. It was planned to re-evaluate her situation at the end of this period.

This help was mainly material, but we are aware of many other "intangible" needs of individuals, and Mrs. H. was no exception. When she first came to the agency she could be described as a rather brittle, suspicious person who dramatized every incident of her daily life. Her manner was very superficial, often rather hostile, and her use of language was stilted. She talked of how well she had done in business, how large her salary had been. She needed to stress how very respectable she was. Usually, we "accept the client where he is," but at the same time we wonder and want to know why people behave the way they do, i.e., why was she so alone, etc.? As the worker accepted her without judgment, her life history began to unfold and gradually it became obvious that Mrs. H. had never before had a good relationship with anyone. She had been a talented child actress and singer, rather victimized by a harsh, unloving and overly ambitious mother who refused her any opportunity for a normal childhood development. Mrs. H. trusted her mother neither financially nor emotionally. Her marriage was almost a continuation of this situation in that her husband's personality was like her mother's. Following her divorce, she returned home and her only brother died suddenly of heart trouble the day after her arrival. This was several years before her own illness began.

At first Mrs. H. refused to believe that she had a serious illness. It quite

often happens that people confronted with situations with which they cannot cope, tend to deny the reality of them. Since Mrs. H. was overly optimistic about the future and wanted to make many plans that far exceeded her capabilities, it was necessary to curb her enthusiasm without actually discouraging her. Substitutes had to be provided. Actually the worker had to make up for some of the losses in her life so that it would be easier for her to accept the present situation. The chief goal with this client was to get her to accept her illness and the idea that she could live with it instead of fighting it. She made many attempts to solicit sympathy from the worker because she had to live in a poor neighborhood on very little money, and attend a public clinic. The worker agreed that it was too bad that Mrs. H. was ill, that it was difficult to change her manner of living due to reduced financial circumstances, but kept pointing up the client's character strengths that would enable her to do it. Over the first ten-week period, a new person seemed to emerge. Mrs. H. found that she could adapt to heretofore distasteful surroundings. Her physical condition became increasingly worse but by this time Mrs. H. believed that she was ill and willingly went for medical evaluation which revealed that she probably could not work again. Findings indicated that death might occur suddenly at any time. She was urged to continue attendance at the medical clinic where she received treatments which gave temporary relief for the discomfort occasioned by symptoms attributable to heart trouble. The worker was able to interpret medical findings, and stress the need for strict diet and rest periods.

Mrs. H. needed an interest that would give her some status or importance. She had had quite a few poems published in a local newspaper. One day, she and the worker visited a settlement house and Mrs. H. entertained a group of women who were folding bandages by reading poetry to them. She particularly drew out a woman reputed to be asocial. Both the director of the club and worker remarked about this and Mrs. H. said, "Well, I used to be an actress and I recognized her as bad audience, so I went to work on her." Arrangements were made to have this club activity continue so Mrs. H. could entertain whenever her physical condition permitted.

Recently, Mrs. H. suffered a cerebrovascular accident not uncommon in her type of heart disease. At present, she is a hospital patient and it is not yet determined what recovery she will make from a partial paralysis. The role of the family agency shows up more markedly now that she is in the hospital. She requests that the worker do the things that families do for patients in a hospital, such as caring for her valuables, etc. Other patients in the ward apparently have noted that she has fewer visitors and they have asked many questions. Consequently on a recent visit by the worker, Mrs. H. said loudly, "Here comes my family now," and throughout her stay used her first name sufficiently loudly that it could be heard several beds away.

For this lonely person suffering from a serious illness the family agency offers the best substitute for relatives and family life.

The next case is of a woman on the verge of a physical and mental collapse, who through the help of the family agency has been restored to many years of useful and happy living.

Miss A., a 69-year-old school teacher, was referred to the agency by a local hospital. She was recovering from an acute attack of bronchial asthma. Her medical history included several of these attacks during the past five years, the most serious one having taken place the previous summer. She was extremely upset emotionally during this time and was reported to have had "psychotic overtones." The psychiatrist who was instrumental in referring Miss A. felt that it was questionable whether she could be helped to maintain an integrated and functional life; and believed that she definitely needed the supportive care of a social agency.

Although she was physically recovered and the school department in which she had taught for over forty years reported on the excellence of her teaching ability and wanted her back, she could not decide whether to return or to retire. There was only about a year and a half remaining before she would normally retire because of her age. She wanted the decision to be made for her but was encouraged to make her own, and at first she decided on retirement. The agency participated in this plan, located a place where she could board and took her to see it. A few days before she was scheduled to move, she telephoned to say she really couldn't go because the person who was going to take her pots and pans could not do so. The worker talked with Miss A., suggesting that if so slight a reason could dissuade her perhaps it was because she really wanted to return to school. She decided it was, and returned.

During the remainder of the school year more of Miss A.'s background was revealed. She had been an only child. Her mother, widowed before her birth, had enveloped her in an intense affection which resulted in failure to mature beyond this level. In many ways she was still a child with a wide-eyed wonder and enthusiasm, which accounted for her unique success as a grade school teacher. After her mother's death she had never returned to the house in which they had lived, never set foot in the church from which her mother was buried, never lived again in the town, although she continued to teach there. She had had an interesting but simple life, had been abroad several times, and devoted herself to her work, but as the years passed and all her relatives died she became increasingly panicky at vacation and holiday times, overwhelmed by her aloneness. She was both tempted and appalled by the approach of retirement.

It appeared that one of the things which Miss A. needed was a warm, sustaining relationship with a substitute "good mother" so that her successes, plans and problems could be shared. This the agency was able to provide for her. It was also apparent that she needed to be kept active and useful. The agency has taken a very active part in helping plan her living arrangements and vacation activities. The agency worker helped her locate a boarding place near her school to reduce the strain and cost of long commuting, and when she tired of this arrangement in the spring, a more lively and interesting place was located where she could attend intellectual activities in her spare time. When it came time to apply for her pension, a worker went with her and helped make out and mail the forms. She needed this much support because of the fear attendant to this final act in her teaching career.

Miss A. has for some time now had implicit faith that the agency would be able to help her make satisfactory retirement plans. Fortunately, we have been able to do this. Keeping in mind her need for activity, physical and emotional protection, and a close connection with the church, we located a position in a combined orphanage and old people's home operated by nuns where she will be allowed as much rest as she needs and can earn part of her support by tutoring backward children, organizing story-telling groups and recreational activities. This has the additional advantage of supplying under one roof all the needs of her life.

Naturally, much of the family agency's work is not on the intensive level indicated in the foregoing case history, but it is typical of many situations coming to us. Because we are well known in the community, we have continual requests for counseling service from younger people troubled about their older relations; from cases needing protective care, and even from a bride of 65 who wished marital counseling. We have taken an active part in all community projects for the aged, recreational, housing, etc., in fact we act somewhat as a community clearing house for all matters pertaining to old age.

Urological Surgery

Austin Ingram Dodson, M.D., F.A.C.S. Second Edition. 1950. St. Louis: C. V. Mosby & Co. 855 pages, 645 illustrations, $13.50.

The second edition of *Urological Surgery* by Austin Ingram Dodson, professor of urology of the Medical College of Virginia, is, as indicated in the preface, a revision of the first edition in those sections in which progress in urology necessitates changes in the presentation of material. This has been accomplished by deletions in some instances and additions in others. The author's purpose at the time of the first edition to present and discuss the surgical problems arising in everyday urological practice has again been ably attained. Chapters on certain aspects of the subject have been contributed by several of Dr. Dodson's colleagues, specialists in their fields.

The material will interest not only the student of urology and the physician who is occasionally confronted with a problem of urological surgery, but also all those interested in the problems of the aged and aging. Frequently the situations which require the attention of the urological surgeon concern the aged individual, and in some instances they occur only in the older age group.

Approximately the first quarter of the book is devoted to general considerations and provides an adequate groundwork for subsequent discussion of specific surgical diseases of the genito-urinary tract. Consideration is then given these diseases beginning with the kidney and progressing organologically in anatomical sequence to the ureters, bladder, urethra, and thence to the penis, scrotum, testicular coverings, testes and appendages. The last two chapters are concerned with the relationship of endocrinology to urological conditions, especially those of the prostate; and finally, surgical approaches to the prostate gland are considered.

Bibliographies at the end of each chapter acknowledge the sources of material incorporated and provide references for additional reading.

The chapters dealing with general considerations are ushered in by a prefatory review of the structure and anatomical relations of the various components of the urogenital tract, with special regard to their surgical significance. Illustrations and diagrams are simple and self explanatory. A brief consideration of general urological diagnostic methods is followed by a section on urography by Dr. Lawrence O. Snead. This includes some excellent roentgenological films depicting various urologic conditions using the flat, retrograde, and intravenous techniques along with a discussion of some of the pitfalls in the interpretation thereof.

Observations by Dr. Charles Nelson on pre- and post-operative care follow established concepts of surgical preparation and after care. The establishment and maintenance of acid-balance and fluid balance is discussed by Dr. Douglas G. Chapman, and the role of various electrolytes and serum proteins are considered in some detail. Some arbitrary formulas are offered as a suggested point of departure, subject to subsequent adjustments in accordance with therapeutic results and indications.

Brief mention of the role of radiation therapy in lesions of the genito-urinary tract, by Dr. Fred M. Hodges and Dr. Randal Boyer, reiterates the oft enunciated precept of adjunctive value of roentgen therapy in relation to surgery and its value in the management of inoperable lesions and metastases.

Dr. Guy W. Horsley presents a history of the development of blood transfusions and describes in detail methods in present use for administration of blood and blood products.

Dr. Dodson devotes the beginning of a series of eleven chapters dealing with the kidney to a description of the various surgical approaches to the kidney, with some mention of the advantages of various incisions. This is followed by ten chapters covering the common surgical conditions of the kidney. These include congenital anomalies and those infections of the renal parenchyma and epithelial linings in which surgical intervention is imperative for the removal of some etiological factor, or for the purpose of establishing drainage, or as a last resort to remove the kidney destroyed by infection. An able discussion is contributed by Dr. T. Leon Howard on the various aspects of diagnosis and treatment of tuberculosis of the kidney which includes a description of the technique of nephrectomy. Indications for surgical intervention in cases of renal trauma are delineated by Dr. George C. Prather, together with a brief discussion of diagnostic procedures and expected clinical course of such injuries. In the following sections on nephroptosis, hydronephrosis, cysts, and tumors, the general principles of pathology, diagnosis, differential diagnosis and surgical management are brought into focus, and usually at least two

surgical procedures for their alleviation are described in some detail. Some of the accepted techniques of performing nephrectomies receive description, and, while surgical technique cannot be learned from a textbook, an excellent panoramic view of the surgical possibilities is attained.

Very cursory mention is made of surgical problems of the adrenal gland. It is felt by the reviewer that a more detailed consideration of this important organ is warranted.

Common surgical conditions of other organs of the genito-urinary tract are handled in the same orderly fashion. Only common conditions are considered in detail. The numerous carefully chosen illustrations are pertinent and well executed.

The place of endocrine therapy in treatment of the cryptorchid testis is taken up by Dodson with appropriate emphasis upon the limitations and dangers inherent in this form of therapy. A suction technique for encouraging descent of the testis is also described, in addition to routine operative procedures for placing the testis in the scrotum.

Androgens and estrogens in the management of prostatic hyperplasia and carcinoma are discussed by Dr. Linwood D. Keyser, who notes the existing clinical evidence that androgens have little to recommend their use in the treatment of prostatic hyperplasia, whereas estrogens have an established place in the treatment of prostatic cancer and evidence of their value in hyperplasia is accumulating.

In the final chapter, Dr. Dodson describes the surgical procedures involving the prostate which are currently approved in urological circles, namely, transurethral resections, suprapubic prostatectomy, retropubic prostatectomy, and perineal prostatectomy, with suggestions as to the merits and drawbacks of each method.

Dr. Dodson and his collaborators are to be congratulated on this well balanced, well documented contribution to current medical literature.

NORRIS J. HECKEL, M.D.
Clinical Professor of Urology
University of Illinois

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Quinidine in Disorders of the Heart

Harry Gold, M.D. 1950. New York: Paul B. Hoeber, Inc. 115 pages, $2.00.

This well-known author has attempted to give a concise discussion of quinidine both from the pharmacological standpoint and from that of practical use of the drug. The chapters involving the pharmacological aspects of the drug are excellently presented and give the clinician a better understanding not only of the actual effects of quinidine but also the possibilities of disagreeable effects which might occur in using the drug. In the reviewer's opinion, however, some of the clinical chapters are not in keeping with the very large experience in this area on the use of quinidine.

The discussion concerning the possible embolism which may occur when the heart becomes regular certainly does not coincide with the statistical evidence in a large series of cases in this area and, therefore, the reviewer must disagree with this part of the presentation. Our evidence would seem to show that, rather than avoid the use of quinidine because of the possible embolic result, one should use quinidine to prevent the fairly high statistical chance of getting an embolus if the heart remains fibrillating. In the experience of the reviewer and those with whom he has been associated, no instance has been seen of an embolus coming off when the heart becomes regular or immediately thereafter. Since this covers a large series of cases in which quinidine was used and the heart became regular, it would seem that the argument against the use of quinidine because of this possible embolism has no value. Regardless of this point of disagreement, however, the reviewer feels that the book has merit in that it brings forth in one volume much of our knowledge concerning this drug and presents it in an easily readable form.

ARTHUR C. KERKHOF, M.D.
Minneapolis, Minnesota

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Diseases of the Heart

Charles K. Friedberg, M.D. 1949. Philadelphia: W. B. Saunders Company. 1081 pages, $11.50.

This book is a most comprehensive text on diseases of the heart. Particular emphasis is laid on the functional rather than the structural aspects of cardiology.

The work is divided into six parts devoted to circulatory failure; the cardiac arrhythmias, the coronary circulation and disturbances in blood supply, structural abnormalities of the heart, etiologic forms of heart disease, and special problems in heart disease.

All phases of the subject including roentgenology and electrocardiography are discussed thoroughly throughout the book, and the most recent advances have been included to bring the subject up to date. The most effective methods of penicillin therapy and the use of aureomycin receive attention; also, the uses of ACTH and cortisone in acute rheumatism.

This volume is a noteworthy study and one of the finest presentations of the subject of cardiology to come forth recently. It should be of great value to general practitioners as well as specialists and also to undergraduate and postgraduate medical students.

THOMAS ZISKIN, M.D.
Minneapolis, Minnesota

DIGESTS *from Current Literature*

Clinical Application of Physical Medicine in Older Patients.

ARTHUR L. WATKINS, M.D., *M. Annals District of Columbia* 19:242-248, 1950.

Heat, massage and therapeutic exercise are the chief physical measures against the ravages of old age.

Hypertrophic arthritis with weakness of the involved joint is a common geriatric complaint. Physical medicine aims here to relieve pain and weakness. Analgesics are helpful. Physical methods include heat in many forms, the end result being increased blood flow which aids in the resolution of underlying inflammatory processes and relieves pain. Heat therapy given in the home is quite adequate provided complete and detailed instructions are given concerning its method of application, duration and frequency of repetition, together with advice as to its possible effects and dangers.

Massage complements and usually follows heat treatment. It is sedative in nature and is directed toward relief of muscle spasm. If a trained therapist is not available, it is best to omit this phase of the physical treatment program.

Therapeutic exercise for patients with degenerative joint disease has two aims: to increase joint range when limited, and to improve muscle power. Careful supervision and instruction of the patient are essential.

Physical treatment of degenerative arthritis of the knees, after the inflammatory phase has been treated successfully, involves progressive resistance exercises. These have their basis in physiological experiments and aim to strengthen the quadriceps. Progressive resistance exercises are ineffective in degenerative arthritis of the hips, but are frequently helpful in degenerative lesions of the cervical and lumbar spines.

Basal Temperature Studies in the Aged Female: Influence of Estrogen, Progesterone, and Androgen.

DOROTHY T. MAGALLON, M.D. and WILLIAM H. MASTERS, M.D., *J. Clin. Endocrin.* 10:511-518, 1950.

Basal temperature curve analysis has become an important procedure in the diagnosis and treatment of gynecologic disorders. A study was made of the influence of estrogen, progesterone, and androgen on the basal temperatures of eight older females ranging in age from 64 to 82 and the suggestion made that the regulation of the temperature curves of menstruation and gestation may depend more on the estrogen—progesterone ratio at critical points in the cycles rather than on individual levels of these substances.

The eight subjects of the study were made to bleed periodically by estrogen exhibition and subsequent withdrawal and then given one mg. of estradiol benzoate twice a week. Monthly shedding of endometrium was accomplished by administration of varying doses of progesterone.

Basal rectal temperatures recorded daily for approximately two years failed to show any definite pattern of temperature rise associated with progesterone administration. However, when the one mg. estradiol benzoate injection was omitted, the patients showed a rise in temperature which returned slowly to normal when progesterone injections were discontinued.

These observations suggest that the rise and decline of basal temperature during the menstrual cycle may depend not on the level of progesterone alone but upon the relative amounts of estrogen and progesterone at a given time, which also explains the temperature curve of pregnancy.

Blood Pyruvate Levels Following Intravenous Glucose Injections in Aged Males.

LUTHER E. SMITH, M.D., *Am. J. M. Sc.* 220: 78-83, 1950.

The time required for the blood glucose level to return to normal following the intravenous administration of glucose is significantly longer in aged subjects than in young adults. However, test results indicate that insulin deficiency is not the primary factor responsible for the prolonged glucose tolerance curves observed in the aged.

A study of arterial blood pyruvate levels after the intravenous injection of 50 cc. of 50 per cent glucose in distilled water was made in three groups of elderly males: a group with normal glucose tolerance curves, a group with prolonged glucose tolerance curves, and a group of diabetics who had been without insulin for 72 hours. No significant difference existed between the mean ages of the diabetic, normal and abnormal tolerance groups.

In the normal group the average time for the blood glucose level to return to the fasting value was 92.0 minutes, in the abnormal glucose tolerance group 143.9 minutes. In the diabetic group, however, the majority of the glucose tolerance curves was still so elevated at the end of two hours that the time for return to fasting level could not be estimated.

The blood pyruvate levels in the two nondiabetic groups increased from resting values of 1.29 and 1.42 mg. per 100 cc. to 1.72 and 1.91 mg., respectively, at 30 to 50 minutes after glucose administration. In all these nondiabetic subjects except one the pyruvate level had returned to the fasting level or below at the end of two hours. In the diabetic patients the rise was minimal.

Sjögren's Syndrome, a Secreto-Inhibitor Syndrome.

HAROLD O. COOPERMAN, M.D., *Ann. West. Med. and Surg.* 4:344-347, 1950.

A symptom complex characterized by dryness of all the mucous membranes due to inadequate secretion by the lacrimal, salivary, and sweat glands, mucous glands of the upper respiratory tract, and the secretory glands of the stomach and even of the vagina is referred to as Sjögren's syndrome and was first described in 1933. It is found almost exclusively in women during and after the menopause. Inadequate lacrimation, keratoconjunctivitis sicca, xerostomia, and dryness of the nose, pharynx, trachea, and bronchi are the rule. Other symptoms include dysphagia, husky voice, impaired senses of taste and smell, inadequate perspiration, and achylia gastrica.

In order of frequency the clinical forms of the disease are: the ocular type usually first seen by the ophthalmologist because of burning and dryness of the eyes; the oropharyngeal type in which dryness of the mouth, nose, and throat may call for attention by the otolaryngologist; and the classic type, generally first noticed by the general practitioner, in which the complaints may include fever, gastrointestinal distress, backache, and swelling of salivary glands in addition to the other symptoms.

Although endocrine dysfunction has been held most likely to be responsible for the condition, the cause is unknown. Suggest that a secreto-inhibitor mechanism may be involved, resulting in too little acetylcholine or too much cholinesterase at the end organ.

Treatment includes the administration of stilbestrol, methyl testosterone, and cholinergic drugs such as pilocarpine.

Major Gynecologic Operations in the Patient over 50 Years of Age.

JOHN C. WEED, M.D., and J. R. MIGHELL, M.D., *Am. J. Ob. and Gyn.* 59:305-310 1950.

The gynecologic surgeon need not let age alone contraindicate major surgery. Patients over 60 years of age tolerate such operations well and perhaps even better than those between 50 and 60 years.

A study was made of 237 hysterectomies performed on women between 50 and 78 years of age. Preoperative symptoms did not vary appreciably from those found in a similar group of younger women. However, malignancies of the internal genitalia were encountered in about 17 per cent. Surgical procedures included total, subtotal, and vaginal hysterectomies. Operative time varied from less than one hour to 90 minutes, while four Wertheim hysterectomies required from two to three hours.

Almost all these surgical patients present some medical involvement. Hypertension, obesity and heart disease are the most frequent complications. The problem of preparation is chiefly one of weight reduction and vitamin supplementation.

Elderly patients should have a thorough medical and laboratory examination. Where vaginal hysterectomy is elected, adequate cornification of the vaginal tract should be induced by use of stilbestrol in 0.5 mg. suppositories for 10 days preoperatively. Reduction of a completely prolapsed organ facilitates surgery and enhances healing. Blood volume should be restored. Early ambulation is stressed. Prophylactic administration of penicillin in 30,000 to 50,000 units at the time of operation and every three hours for the next 36 to 48 hours yields a marked reduction in the morbidity rate.

Abdominal Surgical Emergencies in the Aged.

CONDICT W. CUTLER, JR., M.D., *New York J. Med.* 50:541-544, 1950

Old people with abdominal emergencies have a better chance of life when necessary operations are done promptly. Regardless of chronic illness nearly half survive, but if surgery is withheld nearly every one of these patients will die.

Emergency procedures for intestinal obstruction, acute appendicitis, or biliary disease were done on 100 patients aged sixty to one hundred and two years. Although 52 died in spite of operation, 48 were saved, and the four cases with contraindications to surgery were fatal. About half the deaths were due to intercurrent disease or chronic conditions such as arteriosclerosis.

Condict W. Cutler, Jr., M.D. depends on certain rules for older patients: Use every supportive measure quickly available, operate without delay by the simplest, shortest, least traumatic method, and guard against postoperative complications.

Before surgery, lost fluids and electrolytes should be replaced, blood or plasma administered, and penicillin started. Anesthesia may be general, local, spinal, or crymal, but cyclopropane is usually preferred. Gentle, accurate technic is more important than speed.

Blood is transfused during operation, and postoperative shock is overcome by blood and oxygen rather than stimulating drugs. Pneumonia may be prevented by rebreathing, frequent movement, early rising, and penicillin therapy.

Obstructive lesions of the large bowel require cecostomy or colostomy. If the small bowel is involved, a wide incision is made and involved loops are saved if possible. With hernia, the primary aim is relief of blockade rather than classic repair.

GERIATRICS *in the* NEWS

All announcements and news relating to geriatric medicine and research should be directed to GERIATRICS, Editorial Department, 84 South Tenth Street, Minneapolis 2, Minnesota.

Meetings and Programs

The *American Society for the Study of Arteriosclerosis* will hold its annual meeting at the Hotel Knickerbocker, Chicago, Illinois, November 5 and 6, 1950. For further information concerning the meeting write to the secretary of the society, Dr. O. J. Pollak, Quincy City Hospital, Quincy 69, Massachusetts.

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The third annual scientific meeting of the Gerontological Society, Inc., will be held at the Chase Hotel at St. Louis, Missouri, November 12 and 13, 1950. The four sessions of the scientific program will be held under the direction of Drs. Robert A. Moore, Robert J. Havighurst, Nathan W. Shock, and E. V. Cowdry. Dr. Clive M. McCay is chairman of the program committee.

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The University of Michigan has produced a series of fifteen-minute radio broadcasts dealing with the problems and adjustments of old age. Serving as moderator for the series is Dr. Wilma Donahue of the Institute for Human Adjustment. Further information regarding the use of the programs by clubs and community groups may be secured by writing to the Institute for Human Adjustment, University of Michigan, Ann Arbor, Michigan. Radio stations should write directly to the University of Michigan Station WUOM.

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Fellowships and Research Grants Available

The American Heart Association has announced that applications for research grants-in-aid, including grants to basic sciences, may be filed up to December 15, 1950. Grants-in-aid are available to nonprofit institutions possessing the requisite basic facilities for research and having the necessary experienced investigators on their staffs. Information and application forms may be obtained from Dr. Charles A. R. Connor, Medical Director, American Heart Association, 1775 Broadway, New York 19, N. Y.

The *Louisiana Heart Association* announces two one-year fellowships in cardiology, to be known as the Charles Payne Fenner Jr. Memorial Fellowship and the Leon H. Rittenberg Fellowship, amounting, respectively, to $2,400 and $3,000 each. These will be opened to doctors having previously served at least one year of internship and one or more years of formal resident training in internal medicine or pediatrics. Applications should be mailed to Dr. Allan M. Goldman, Secretary-Treasurer, Louisiana Heart Association, 3439 Prytania Street, New Orleans.

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Care of the Chronically Ill

Connecticut has launched one of the first state-wide study-planning-action programs to meet the problem of chronic illness. Developed by the State Commission on the Care and Treatment of the Chronically Ill, Aged and Infirm, the Connecticut Plan has four main objectives: (1) pilot study in rehabilitation of the chronically ill at Rocky Hill Veterans Home and Hospital; (2) state support of rehabilitation wards in general hospitals; (3) plans completed for a combined hospital-domiciliary care institution at New Britain; and (4) improved standards for nursing homes.

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In the first year of operation of the rehabilitation department of Goldwater Memorial Hospital, New York City, 50 of the 150 persons admitted were discharged either to jobs or to live self sufficiently at home, according to a recent report from the hospital. In addition 30 were discharged to other hospital wards and will be able to care for themselves either partially or fully, needing little nursing care. Sixty of the department's 150 patients are now in the process of completing their rehabilitation and eventually will be discharged. In age, patients ranged from 16

(Continued on page 36A)

GERIATRICS

Rejuvenative, or Preventive and Eliminative Treatment of Senility*

V. Korenchevsky, M.D.†

IT IS POSSIBLE to consider the medical treatment of old age and research on this problem along two main lines. The first is rejuvenation of old organisms, i.e., a more or less complete reversal of senile organs and their functions to, or towards the level observed at a younger age. The second consists of prevention of the processes of aging, and if they are already developed, of their more or less complete elimination by suitable medical treatment.

Each of these two types of geriatric treatment might be divided again into subtypes directed against basic primary and secondary processes of aging, produced by primary or secondary causes of aging respectively.

At present we do not know anything about the features of normal physiological senescence, nor about the basic primary causes which produce them, because currently there are no individuals who age normally and live a normal span of life.

PRESENT DAY old age is a kind of illness because it is premature and complicated by several so-called "senile degenerative" diseases. The latter, however, have no connection with the normal basic processes of aging, and should be defined as secondary processes of senescence, produced by secondary causes.

These causes are non-specific but capable only of accelerating the processes of aging. A great number of the secondary causes include any of those non-specific factors which increase wear and tear and involution of the whole organism or only of one or more organs and tissues. To these

*Read at the seventh annual meeting of the American Geriatrics Society, New York City, June 1, 1950.

†Head of the Gerontological Research Unit, Oxford, England.

causes belong infectious diseases; intoxications by various outside poisons; accumulation of, and autointoxication with, metabolic waste products or gastro-intestinal poisons; deficiencies of vitamins or hormones, or hypersecretion of the latter; improper nutrition; pathological changes in any tissue, organ or blood; physical or mental traumas, etc. In detail the problem of primary and secondary processes and the respective causes of senility has been discussed elsewhere.[6,8]

GERIATRIC RESEARCH AND ITS METHODS

THUS, geriatric research can be carried out, as far as possible, along four lines. Practically, it has to start almost from scratch. For obvious reasons there is at present no science of geriatrics as a specific medical treatment leading to the improvement or cure of basic primary processes of aging. Also, we know very little, if anything, about the effective treatment even of the secondary processes of senescence.

There is a widespread and dangerous misunderstanding to the effect that geriatric research can be performed on human beings only. On the contrary, and undoubtedly, it has to start with experiments on animals.

To start geriatric experiments on old persons is inhuman, unless the experimenter is sure that his experimentation cannot produce any harmful effects on his patients. Thus, to cite an example, as my experiments on senile rats have shown, several new pathologic lesions might easily be caused by geriatric treatment. Such treatment might aggravate, sometimes severely, the senile condition and sufferings of human "guinea-pigs." There is not the slightest doubt that some of the author's experiments on himself, in treating his own old age, will cost him at least a few, if not more, years of his life.

In dangerous, or from this point of view doubtful, experiments, the only justifiable use of human guinea-pigs should be limited to the experimenters themselves. The history of medicine is full of such self-experimentation. The medical research workers will no doubt continue this noble tradition from one generation to the other.

REJUVENATIVE TREATMENT

DESPITE our incomplete knowledge of the subject, it is possible to state that the morphology, physiology and biochemistry of a very young growing organism are substantially different from those of the adult, and ever so much more different from those of an old individual.

The cessation of growth processes is mainly responsible for this difference in the adult, to which condition the weakening changes of all organs and functions is added in the old.

Obviously, even if rejuvenation of all organs and functions to the level observed in childhood would be possible, it would be most undesirable and probably disastrous for the species. It is easy to imagine what would result,

for example, from a resumption and continuation of growth, a high, intense metabolism level, and tender, child-like constitution of organs and tissues in such "rejuvenated" seniles.

Rejuvenation of an old man, were it possible, to the level of a fully developed organism of about 25 to 30 years of age might not, from a cursory consideration, appear so dangerous. Practically, however, some harmful effects probably are bound to occur if rejuvenation by stimulating factors is put into operation, since their safe control in a fully developed organism is probably most difficult, if possible at all.

ESPECIALLY dangerous might become those stimulating factors which promote growth of the whole organism, or of certain organs or tissues. Interference with the natural brake mechanisms which control the processes of growth, at the time of life when these brake mechanisms are in full operation (adult life or old age), might result, for example, in gigantism, if not of the whole organism, so at least of some organs or tissues (as in the case of acromegaly); or in disorganized growth (tumors, monstrosities); or in the degenerative and aseptic inflammatory changes produced by intoxication with overstimulating factors.

The results of experiments by Korenchevsky and co-workers on senescent female and male rats[11,12,13] and new results so far unpublished suggest these possibilities strongly. On the basis of these experiments it is possible to state that, at least in the rats:

(1) Reversal of some senile organs (but not of the whole organism) to the level observed at a younger age is possible. This is certainly a most important fact which changes our outlook on the whole problem of senility.

(2) Simultaneously, however, with these apparently anti-aging effects, due to the causes above mentioned, the adenomatous tumors, or degenerative and inflammatory changes might occur in the sex organs, thyroid, parathyroids, adrenals, thymus, liver, kidneys, heart and pancreas of some of the treated senescent animals.

(3) Therefore, at present, before several morphological, physiological and biochemical experiments on animals are finished, the geriatric treatment of old men and women with substances possessing anti-aging (or so-called rejuvenating) properties, appears to be dangerous, in some cases very much so.

(4) Suppose that in the above-mentioned experiments[11,12,13] no pathological changes were to complicate the reversal of some senile organs to the level observed at a younger age. Numerous experiments would still be necessary to decide whether a super-rat was produced, or a kind of splanchnomegalic monstrosity.

(5) The following reason explains the failure in our experiments to produce a true anti-aging effect on the whole organism. The causes of aging, secondary and probably primary, are numerous. Accordingly, the respective anti-aging factors must be also numerous. Therefore it would be unreason-

able to expect a single factor or a single group of factors (e.g. hormones) to reverse all processes of senescence. There is no doubt that the future treatment of senility will be manifold, and that a so-called "elixir of life" will contain many chemical substances.

PREVENTIVE AND ELIMINATIVE TREATMENT OF SENILITY

Fortunately, rejuvenation is not the only way of approaching normal aging and normal old age. As it was previously stated, there are numerous diseases which complicate present day pathologic aging and which are responsible for many features of premature and abnormal senility and premature death. These diseases are not features of normal physiological old age, since even now they are not present in all old individuals.[8] Prevention and elimination of all these diseases will, without doubt, make a gigantic step in gerontological research towards normal old age. Moreover, from such research only the most favorable results, in no way harmful, can be expected.

The power of science is very great, and the progress of research sometimes becomes unexpectedly rapid. For example, the recent discoveries of the decholesterolization by, and some other effects of, choline, inositol and methionine[1,2-5,14-16] and the decalcifying properties of the anti-stiffness factor[17,18] opened new promising vistas for research on treatment of arteriosclerosis and angina pectoris, both number one killers of old persons. In the case of anti-stiffness factor, most investigators confined the results obtained by Wagtendonk and his co-workers, but some[19,20] were unable to do so.

Then, besides these complicating diseases, there are some other secondary and also primary causes of aging. It is improbable that all of them can be eliminated, especially the primary causes, the elimination of which would make immortality possible. Elimination, however, of some so far unknown secondary causes of aging might become practicable when their nature and action are investigated by gerontology.

This will mean a second gigantic step towards normal aging and old age, and, as in the case of "senile" diseases, a perfectly harmless step. It is obvious that all these problems are difficult and require manifold experiments to be answered correctly.

HARMLESS EXPERIMENTATION WITH HUMAN PATIENTS

In clinical research centers it is possible to perform various geriatric experiments on patients without risk of producing harmful effects. In these *properly equipped* centers it is possible to devise several research schemes, in which, by suitable tests and technique, harmful effects could be carefully looked for, prevented, or if necessary, checked at the moment of their appearance. Some of these experiments, although simple, might give important practical results. So far they have not been carried out with thorough techniques. The following illustrations may be cited as examples.

Although gastrointestinal autointoxication is only one of many sec-

ondary causes accelerating the processes of aging, it definitely needs a careful scientific investigation. Such simple measures as to decrease or eliminate it with lactic bacteria (yogurt) have been investigated insufficiently and superficially.

The action of some vitamins has been investigated, but the effects of all known vitamins, *administered simultaneously* in suitable doses, have not. The only vitamin which needs careful handling and which might become harmful for old people is vitamin D because of its calcifying properties.

There are also exhaustive experiments needed with other nutritional substances which are important and which could hardly produce harmful effects.

ACCORDING to Carrel and other investigators,[8] removal of metabolic waste products which accumulate in and intoxicate old organisms is of the greatest importance for preserving youth and preventing premature senility. It might even cause some features of senile cells to revert to those present in young animals. Some complicated experiments will be necessary for solution of the waste products problem, but there are also some possible simple experiments on the subject.

For instance, it has been suggested several times that drinking considerable amounts of water before breakfast, on an empty stomach, might help in washing out some of those waste metabolic products which accumulate in, and poison the organs and tissues of old people. This simple measure was never investigated properly with accurate biochemical and functional tests.

In future geriatric treatment, not only all major causes of aging have to be eliminated, but minor ones as well. This indicates that future treatment of aged patients will be both complex and prolonged.

Large funds are necessary for gerontological, and in particular, geriatric research. The author cannot see how this can be achieved without the establishment of a special foundation for research on old age,[7,9,10] justified by the fact that the problem of old age is a VITAL problem for EVERY human being.

Another factor which will hasten the progress of gerontology is the cooperation of gerontologists in all countries in their research work. It is obvious that two or more stupid brains will not make a clever one, while the cooperation of clever brains might result in great achievements, sometimes equal to those of a genius. This cooperation is one of the principal aims of the International Association of the Gerontological Societies.

CONCLUSIONS

1. At present, the harmless, and from a practical point of view, the most promising lines of geriatric research are preventive and eliminative treatment of senility.
2. The rejuvenative treatment of senility, on the contrary, might easily become dangerous in its practical applications, as the experiments on rats suggest. Its danger is not only in simultaneous production of

pathological changes in various organs, but also in its tendency to change the nature of the species. Even if the latter is far from ideal, it is necessary to remember that all the features of the species were fixed after millions of years of biological development. Therefore, all attempts to change these features place a great responsibility on the gerontologists and necessitate the greatest caution.

3. Before starting geriatric treatment of human beings, numerous morphological, physiological and biochemical geriatric experiments on animals, in properly equipped research centers, have to be performed in order to ascertain the favourable effects, and absence of any harmful action.
4. A possibility of reversing some of the senile organs and functions in rats to the level observed at a younger age suggests that unexpectedly important results, which might change all our outlook on the problems of aging, could be obtained in research on old age.

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If it is sensible for the child to prepare to become an adult, it is equally so for the adult to prepare for his later years.

—EDWARD J. STIEGLITZ, M.D., at the National Conference on Aging

Physiological Aspects and Treatment of Emphysema*

Burgess Gordon, M.D., *Hurley L. Motley,* M.D.,
Peter A. Theodos, M.D., *and Leonard P. Lang,* M.D.

THE TERM EMPHYSEMA designates the condition of distended pulmonary alveoli. It is characterized in the broadest sense as a localized or general distention of the lungs occurring chiefly in middle age or later. The various types are classified as hypertrophic, focal, compensatory and senile emphysema. The condition develops independently or in association with chronic pulmonary disease, and may be a concomitant of the aging process. In this discussion of emphysema of the aged, the hypertrophic and focal types are especially considered.

The important changes of hypertrophic emphysema are: (1) atrophy and rupture of the alveolar walls; (2) great distention of the alveoli and the ruptured areas; and (3) obliteration of the numerous capillaries of the lung.[1] In the senile type there is thinning and often rupture of the alveoli with loss of elasticity of the interstitial pulmonary tissue, giving an appropriate terminology to the condition. The lungs usually are small and contracted. With the focal type, small areas of conglomerate distention of alveoli may be disseminated throughout the lungs. While the pathology of uncomplicated emphysema is not altogether typical of the aging process because of the absence of pulmonary arteriosclerosis, a striking feature of advancing years, there is a degree of similarity, such as the loss of elasticity of the alveoli.

Function impairment of uncomplicated emphysema is concerned with the movement of air in and out of the lungs; in complicated emphysema, as in pulmonary fibrosis with its associated vascular deterioration, there is the additional factor of interference with gas exchange. That is, there is an impairment of the mixing and dilution mechanism.[2,3] A significant feature of emphysema often concerns the associated pathological changes which may be entirely masked in the clinical studies without the benefit of function investigation.

The physiological failure of breathing impairment in emphysema is illustrated in the current studies of anthracosilicosis at the Barton Memorial Division of the Jefferson Hospital.[4] The data discussed in this paper relate

*From the Department of Medicine, Jefferson Medical College, and the Barton Memorial Division, Jefferson Hospital, Philadelphia, Pennsylvania. Read before the sixth annual meeting of the American Geriatrics Society, June 6, 1949, Atlantic City, New Jersey.

Aided by a grant from the Anthracite Health and Welfare Fund of the Jefferson Hospital.

chiefly to fifty aging coal miners with minimal anthracosilicosis and others with the characteristic features of emphysema, but whose function investigation disclosed variable degrees of pulmonary fibrosis related to scarring of the alveoli and alterations of the blood vessels.

The studies of emphysema *per se* concern the total amount of air discharged from the lungs in a single, free expiration (vital capacity) and the amount of dead air that remains in the lungs after expiration, as estimated from a series of full respirations in percentage of total lung volume (maximal breathing capacity). Vital capacity represents the effectiveness of pulmonary contractions in expirations and the degree of congestion or impairment of tissue that may reduce the air space of the lungs; fatigue and emotional factors may influence the accuracy of the test. The determination of maximal breathing capacity gives informative and critical data, since it is related to movements of the diaphragm, the function of intercostal and other accessory muscles of respiration, the patency of the tracheobronchial airway, the elastic property of the lung tissue and neuromuscular coordination.

PHYSIOLOGICAL STUDIES

THE MAXIMAL BREATHING CAPACITY, vital capacity, minute ventilation, breathing reserve, and the roentgenographic changes were correlated with the degree of pulmonary emphysema, as suggested by Cournand and Richards.[2] The studies indicate that maximal breathing capacity is a valuable test of function.[3] With a maximal breathing capacity of less than 40 liters per minute, the emphysema was a factor in the impairment of pulmonary function. Vital capacity as a single measurement was of limited value for determining the extent of the emphysema and a less reliable index of pulmonary function impairment than maximal breathing capacity. The vital capacity determinations were of greatest value in the calculation of total capacity. The decrease in vital capacity below the predicted value was consistently less than the reduction in maximal breathing capacity. No constant relationship existed between vital capacity and maximal breathing capacity, however, and, with few exceptions, the maximal breathing measurements were a more reliable indication of the degree of disability than the deviations in vital capacity. In most cases the total lung volume was decreased. Certain cases showed an increase and in a few instances there was no significant change.

Hyperventilation occurred in nearly all cases, but there was no significant correlation between the extent of hyperventilation and the degree of emphysema. Hyperventilation is a compensatory mechanism, however, and during the early stage of emphysema it may be adequate until loss of lung elasticity and obstruction of the alveoli and smaller bronchi markedly decrease the maximal breathing capacity and vital capacity. The minute ventilation alone is not related to the extent of pulmonary disability.

Impairment of pulmonary function, including the transfer of O_2 and CO_2 between the alveoli and arterial blood, indicates the interference of fibrosis with the uniform aeration of the alveoli. In the basic mechanism the

affected alveoli are poorly ventilated with a resulting increase in the mean pressure gradient of pO_2 between the alveoli and the arterial blood.

Distribution is one of the factors contributing to the alveolar-arterial pO_2 gradient. This is defined as: (1) the variation in alveolar pO_2 in different parts of the lungs; and (2) the ratio of alveolar ventilation to alveolar perfusion. In certain instances the blood supply to alveoli is obliterated due to fibrosis permitting ventilation but not perfusion, thus increasing a physiological dead space and reducing the efficiency of O_2 removal per liter of ventilation. Studies carried on with high and low levels of oxygenation indicate that the increased pO_2 gradient between the alveoli and arterial blood is primarily one of distribution and not a diffusion difficulty (increased resistance to passage of oxygen through the pulmonary membrane). It was observed that the pulmonary function impairment of distribution may produce marked arterial oxygen unsaturation at rest, even in the absence of marked emphysema and with a normal maximal breathing capacity.

THE COMPENSATORY mechanism for the mixing and dilution impairment, resulting from the increased volume of residual air, is hyperventilation. The extent of this response varies widely, so that compensation is effective in some patients and faulty in others with the same degree of emphysema. The dyspnea level varies widely, a fact which explains why the severity of respiratory symptoms is not an accurate measure of the relationship between the residual air and the total lung volume.

The roentgenographic findings in certain cases were not altogether helpful in the evaluation of impaired pulmonary function. Pulmonary function impairment was altered only moderately in certain cases with characteristic features of emphysema (increased illumination of the lung fields and lowered diaphragm), while in others with minimal alterations of the roentgenograms the pulmonary function was greatly changed.

The incidence of right heart strain as manifested by electrocardiographic changes was correlated with physiological studies of pulmonary function, chest roentgenograms and fluoroscopic examination. There was a relationship between the incidence of right heart strain and the degree of emphysema based on quantitative measurements of residual air. In general, the lower the resting mean arterial pO_2, the higher the incidence of right heart strain. Short induced periods of acute hypoxia, however, produced minimal electrocardiographic changes.

GENERAL CONSIDERATION OF EMPHYSEMA

THE physiological and anatomical changes of emphysema with associated fibrosis apparently are closely related. It appears that the course of emphysema is influenced by (1) increased alveolar pressure; and (2) resistance of the walls of the alveoli. Although atrophy of the alveolar walls is not the typical feature of the aging process, thinning of the alveoli soon becomes an important aspect of progressive disease. With senile emphysema there is a

paradox in terminology, since both the lungs and the alveoli remain small. While this condition is characteristically unlike hypertrophic emphysema, the clinical symptoms may be parallel. It has been suggested that the lungs with senile emphysema hold potentialities for the development of hypertrophic emphysema and could become hypertrophic if they were subjected to the inroads of increased alveolar pressure. The factor of individual susceptibility to emphysema has been widely debated. While an apparent predisposition has been observed in families, the basic disturbance is primarily increased alveolar pressure and distention.

In normal breathing the movements of the lungs are both horizontal and vertical. The characteristic mechanism is contraction of the chest and lowering of the diaphragm in full inspiration. Inspiration is essentially an active muscular effort; expiration is passive and depends on the recoil of the lungs and the elasticity of the chest wall. In strenuous exercise there is a modification of the respiratory movements. The diaphragm rises only partially, with the lungs remaining somewhat distended. In a sense, expiration is imperfect and each succeeding inspiration begins before the expiration is completed. With a demand for more air there is increased inspiratory effort, which, however, remains uncompensated since there is no corresponding degree of expiration. The expiratory muscles are brought into play but their effectiveness is transient because of fatigue and difficulty of coordination, with the result that inspiration remains compensatory. While the normal lungs assume their previous movements, positions, and functions following exercise, the abnormal lungs tend to remain stretched, even after a prolonged period of rest. Hyperpnea is a fundamental mechanism in the development of pulmonary distention. Indeed, increased inspiratory pressure alone will not result in pulmonary distention without the physiological role of hyperpnea. The combined effects of increased inspiratory and expiratory pressure are definitely contributory in the development of emphysema.[1]

Overdistention of the bronchi and alveoli resulting from disease are causes of atrophy of the alveolar walls and their permanent dilatation, as noted especially in long-continued cases of asthma and chronic bronchitis. In these conditions the mechanism is related to partial and transient obstruction of the bronchi with retention of secretions and swelling of the mucous membrane. The obstructions, varying in extent, distribution, and duration, eventually favor the development of widespread alterations of the alveoli. Bronchial spasm may be closely associated with the blockage of bronchi, which is especially evident during attacks of bronchitis. Important contributing factors involved in the attacks relate to cough and forceful respiration. These are traumatizing to the diseased pulmonary tissue and apparently aggravate bronchial spasm. In turn, there is accentuation of the physiological disturbance.

The association of the heart and emphysema has been widely discussed in recent years. The considerations relate to the evaluation of symptoms, the

degree of oxygen saturation of the blood, alterations of venous pressure, the behavior of the diaphragm, and the influence of infections. It has been suggested that when the heart fails as a result of emphysema, the cardiac insufficiency is not necessarily related to increased pressure in the lesser circulation, but rather to the impaired coronary circulation and the superimposed effects of anoxemia upon the myocardium. It has been pointed out that patients with emphysema experience dyspnea, cyanosis, and edema of the dependent parts—characteristic features of myocardial insufficiency—and these manifestations may be related to increased oxygen unsaturation of the blood, caused by impairment in pulmonary ventilation. It is not uncommon in emphysema for myocardial insufficiency to develop during attacks of bronchitis and bouts of asthma, and for the heart to return to normal as the pulmonary condition improves. The influence of peripheral venous pressure has been stressed, since it is known in emphysema that sometimes there is a considerable rise of venous pressure. With distention of the lungs, the negative pleural pressure is decreased, while there is a more or less corresponding increase of venous pressure. The low position of the diaphragm may also be an important factor in the development of manifestations in emphysema. There is apparently a retardation of the free flow of blood at the aperture through which the inferior vena cava passes, resulting in a possible decrease in volume output of the heart.

TREATMENT

The effective treatment of emphysema demands careful management of the associated medical and surgical conditions. Disturbances of the upper respiratory tract, the general circulation, the genitourinary system, and the gastrointestinal tract must be corrected; otherwise, specific management of emphysema will be ineffectual. Indeed, an adequate air passage is essential, and, obviously, mechanical obstructions to breathing must be corrected before other methods are instituted. The inguinal hernia which interferes with effective contraction of the abdomen for elevating and controlling the diaphragm, as required in cough, must be corrected surgically or with a suitable hernial support; otherwise, necessary evacuation of the dependent bronchi will not be accomplished. Impairment of the feet should not be overlooked, since the uncomfortable walking will aggravate the dyspnea.

While rest is indicated in elderly persons with respiratory distress, undue physical inactivity may be harmful, especially for those who possess some degree of available pulmonary function. Exercise is valuable for maintaining the general health and should not be discontinued entirely. It facilitates the resolution of intercurrent infection and between attacks it may serve as a helpful accessory factor in circulation of the blood. Exercise, therefore, should be regulated according to the occurrence and degree of dyspnea and the pulse and respiratory rates. Increased discomfort and the accelerated respiration and pulse rates call for limitation of activities; stair climbing and rapid walking, especially against the wind, should be avoided.

In prescribing drug treatment for emphysema, it should be emphasized that expectorant drugs and sedation commonly used are more disturbing than effectual; codeine is especially apt to favor the retention of secretions. In failure of the circulation due to primary myocardial disease there may be some benefit from digitalis and theobromine derivatives, but there is no useful action in cor pulmonale *per se*. Mercuhydrin, two cc., given intramuscularly once weekly is sometimes effective for controlling persistent edema; the drug should be used cautiously in kidney disease. It is essential in general management to maintain an adequate intake of protein.

While the value of intermittent positive pressure breathing is chiefly symptomatic for the relief of dyspnea, certain objective effects have been noted. For example, it promotes bronchial drainage, provides more uniform alveolar aeration and protects against atelectasis, increases lymph flow from the lungs, combats acute pulmonary edema, provides a form of breathing exercise and improves muscle tone, and favors the uniform distribution of aerosols. The greatest value in the aged is to increase the possibilities for increased physical activity.

The mechanism of intermittent positive pressure breathing treatment relates to: (a) active inflation of the lungs under positive pressure from a cycling valve with maximal peak pressure at the mouth adjustable from 0 to 30 centimeters of water; (b) passive deflation induced primarily by the elasticity of the lungs and chest wall; and (c) cycling which follows the patient's own pattern of breathing[5,6].

It is customary to use 100 per cent oxygen with aerosols (Vaponefrin and Neosynephrin). The treatments are given two or three times daily for the acute episodes and two or three times weekly for mild or continued manifestations (dyspnea, bouts of cough and difficult expectoration). The usual period of treatment is 15 minutes. It is advisable to limit the dosage of aerosols to eight drops as larger doses may cause palpitation.*

A preponderance of abdominal movements in breathing is characteristic of advanced emphysema. At first it appears helpful in moving air in and out of the lungs during respiration. As abdominal breathing becomes a requirement or a habit, the vertical excursions of the lungs are accentuated, the horizontal movements limited. While the apices become less and less active, the bases remain overactive, stretched, and distended. With progressive emphysema, the diaphragm is lowered and reduced in function, dead air accumulating in the bases. Accordingly, the initial value of compensatory abdominal breathing is lost. With deterioration of the abdominal muscles impaired diaphragmatic function is accentuated. The aged person finds that forceful contraction of the abdomen alone fails to give relief, but that pressure exerted over the abdomen may be helpful.

*Intermittent positive pressure breathing apparatus is manufactured by the Mine Safety Appliances Company, Pittsburgh, Pennsylvania, and V. Ray Bennett, 8154 Beverly Street, Los Angeles, California.

It has been observed that abdominal compression,[7] as obtained from wearing a special type of abdominal support,* will elevate the diaphragm to the levels of expiration. In the higher range of movements the diaphragm becomes more effective physiologically. In not a few instances there is a striking improvement in breathing and reduced cough, due perhaps to the facilitated movement of air in and out of the lungs. In combination with intermittent positive pressure breathing, drainage of secretions from the dependent parts of the lungs is facilitated. The most favorable results are obtained in aged patients with a relaxed and full type of abdomen and a moderate degree of emphysema.

SUMMARY

EMPHYSEMA is not necessarily representative or even specifically associated with the general aging processes of the body. However, the aspects of emphysema are significant. The lungs and heart are responsible for the delivery of oxygen to the tissues and the removal of carbon dioxide from the body. The heart labors under a handicap in the presence of emphysema and its complications (emphysema unassociated with pulmonary vascular disease is uncommon). The heart as well as the generalized tissue are affected as a result of oxygen unsaturation. It is conceivable that the lack of oxygen has widespread effects, as suggested in general body weakness, clubbing of the fingers, as well as disturbed pulmonary functions. The use of intermittent positive pressure breathing and diaphragmatic elevation will facilitate movement of air in and out of the lungs, providing symptomatic relief.

CONCLUSIONS

1. Certain factors involved in the production of emphysema are discussed.
2. The mechanism of increased intra-alveolar pressure relating to bronchospasm is stressed.
3. The use of intermittent positive pressure breathing with vaporization of bronchodilator drugs is described.
4. The supplementary use of diaphragmatic elevation obtained with a special type of abdominal support may be of value in cases with relaxed and full type of abdomen.

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*The support consists of a pad, back-piece and two cross-springs. It is manufactured by Nulty-Coggins, 1921 Chestnut Street, Philadelphia, Pennsylvania.

Effect of Potassium Iodide on Aortic Atherosclerosis in Rabbits*

Campbell Moses, M.D., *and Grace M. Longabaugh*, B.S.

POTASSIUM IODIDE has been widely used for many generations in the treatment of arteriosclerotic vascular disease. The mechanisms upon which this clinical usage has been based are not clearly defined, although it is well known that an optimal iodine intake is essential for normal thyroid function, and that hypothyroidism is associated with hypercholesterolemia and presumably with accelerated atherosclerosis. Several years ago Turner[1-4] studied mechanisms for preventing cholesterol atherosclerosis in rabbits and concluded[3] that potassium iodide loses its effectiveness in preventing dietary hypercholesterolemia after a few months. Page and Bernhard[5] confirmed the initial effectiveness of iodine in delaying the development of atherosclerosis in rabbits with dietary hypercholesterolemia. In view of the recent emphasis upon the importance of weight changes in the study of experimental atherosclerosis,[6, 7] it is interesting to note that in the report by Page and Bernhard, the animals receiving the organic iodine compound uniformly lost weight. This study was undertaken to determine the effect of administration of iodine on the development of atherosclerosis in hypercholesterolemic rabbits during a period of weight gain.

METHODS

MALE albino rabbits of a New Zealand strain were used. All the animals were from a single colony and were between ten and 12 months in age. Cholesterol was administered by dissolving five grams of cholesterol in ether and mixing this with Purina rabbit chow. The ether was evaporated and rabbits paired in cages were fed cholesterol by this technic three times each week. Potassium iodide solution in determined doses was fed individually to the animals daily. No supplementary feedings of vegetable greens were provided during this experiment.

Total cholesterol determinations using the Lieberman-Burchard reaction were made on ear vein blood each week. The animals were weighed twice weekly throughout the course of the experiment. At the conclusion all animals were killed by nembutal administration and the thoracic and abdominal aortas were removed and fixed in formalin. In each case the entire aorta was stained with Sudan IV and the presence of atherosclerosis confirmed by microscopic examination. The degree of atherosclerosis in the aorta was graded arbitrarily in the Sudan-stained gross preparations on a

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This project was supported in part by a grant from the Sarah Mellon Scaife Foundation.

one plus to four plus scale. Gross and microscopic examinations of the liver and kidneys were made in all experimental animals.

Three groups of rabbits were studied. Group I consisted of 13 rabbits fed cholesterol without additional potassium iodide for seven weeks. Group II consisted of 12 rabbits which had received cholesterol as well as 325 mg. of potassium iodide each day for seven weeks as a saturated solution administered orally with a medicine dropper. Group III was made up of 29 rabbits fed for seven weeks on the cholesterol regimen plus 20 mg. of a two per cent solution of potassium iodide administered orally.

RESULTS

THE DATA obtained are summarized in the accompanying tables. Table I illustrates the findings in the cholesterol fed controls, Group I. Of this group

TABLE I
CHOLESTEROL FED CONTROLS

Rabbit No.	Initial Weight gms.	Final Weight gms.	Control Total Cholesterol mg./100 ml.	Final Total Cholesterol mg./100 ml.	Aortic Atheroma
268	2200	3414	88	1562	3+
270	2876	2844	74	1580	3+
272	3016	3426	60	1419	2+
274	3138	3254	64	1114	0
276	3068	3652	72	1405	3+
278	2882	3118	31	944	1+
280	3234	3548	64	982	1+
282	3279	3841	113	1580	3+
286	2992	3654	100	1433	2+
288	2872	3106	26	647	0
290	3344	3622	60	1995	1+
292	2337	3584	61	1301	2+
294	3230	3324	72	1541	3+

of 13 rabbits with an average weight gain of 416 grams and an average final total cholesterol of 1346 mg. per cent, two animals, or 15 per cent, had

TABLE II
CHOLESTEROL FEEDING
PLUS 325 MG. OF POTASSIUM IODIDE DAILY

Rabbit No.	Initial Weight gms.	Final Weight gms.	Control Total Cholesterol mg./100 ml.	Final Total Cholesterol mg./100 ml.	Aortic Atheroma
176	1940	2764	32	1069	0
177	2048	3381	51	1599	4+
178	1942	2880	99	1931	0
179	1863	3062	68	1962	3+
180	2166	2816	51	732	1+
181	2346	3489	52	1678	4+
182	2031	2936	53	760	2+
183	2075	3604	37	1338	2+
184	2017	3213	43	1678	0
185	2524	3825	30	566	0
186	2147	2894	25	481	0
187	3484	3439	31	1132	4+

TABLE III

CHOLESTEROL FEEDING PLUS 20 MG. OF POTASSIUM IODIDE DAILY

Rabbit No.	Initial Weight gms.	Final Weight gms.	Control Total Cholesterol mg./100 ml.	Final Total Cholesterol mg./100 ml.	Aortic Atheroma
196	2327	2936	64	1511	3+
197	2694	3590	45	1244	3+
198	2650	4026	47	1069	2+
199	2378	3182	62	809	0
200	2366	3070	35	1745	4+
201	2070	2920	38	828	0
202	3246	3510	44	1314	2+
203	3747	3802	25	1233	2+
205	2628	3052	46	1255	0
207	2968	3086	44	1078	1+
208	3154	3030	52	651	2+
209	3106	3044	72	989	2+
253	3128	4459	56	956	2+
263	2880	3286	34	819	1+
267	2850	2912	48	1326	1+
269	2710	2826	70	1599	4+
271	3130	3508	52	1314	2+
273	2794	3238	84	1326	3+
275	2792	2536	59	1449	2+
277	3162	3324	76	853	3+
279	2373	2664	85	1289	1+
281	3396	3544	82	1013	2+
283	2462	2428	91	1619	3+
284	3081	3698	85	1619	4+
285	3086	3296	44	1301	3+
287	3082	3805	99	828	2+
289	2666	3015	109	1419	2+
291	2741	3124	63	1675	0
293	2650	3030	39	1255	1+

no discernible aortic atheroma and 62 per cent had atheromas graded two plus or more. In Group II (data summarized in Table II) all except one of the 12 rabbits gained weight. The average weight gain was 977 grams and the average final cholesterol determination was 1244 mg. per cent. Six animals, or 50 per cent of the group, had aortic atheromatosis graded two plus or more despite the administration of 325 mg. of potassium iodide daily. The animals in Group III had an average weight gain of 411 grams and an average final total cholesterol of 1220 mg. per cent (Table III). Of this group 18 rabbits, or 62 per cent, had atheromatosis graded two plus or higher, although they received 20 mg. of potassium iodide daily.

SUMMARY AND CONCLUSIONS

Three groups of rabbits with dietary hypercholesterolemia during a period of weight gain were studied. Group I, the control group consisting of 13 rabbits, received only a high cholesterol diet. Group II, 12 rabbits, received 325 mg. of potassium iodide orally each day in addition to the high cholesterol diet. Group III, 29 rabbits, received the high cholesterol diet plus 20 mg. of potassium iodide daily.

The incidence of aortic atheromatosis graded two plus or higher

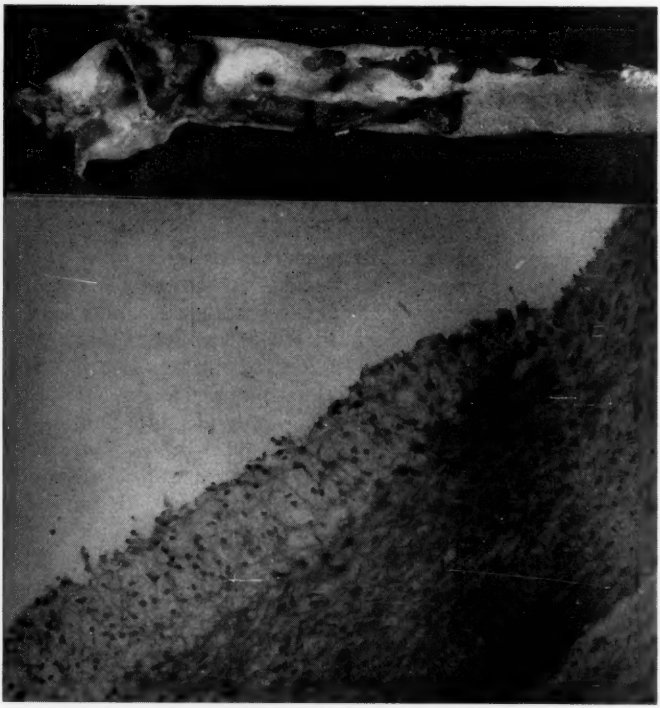

Fig. 1 (Above). Sudan stained rabbit aorta showing four plus atheromatosis. (Below). Low power view of aortic atheroma.

was 62 per cent in the cholesterol fed controls, 50 per cent in the group receiving the larger dose of potassium iodide and 62 per cent in those fed the smaller dose of iodide.

It is evident from these data that the administration of potassium iodide as carried out in this study failed to influence markedly the development of aortic atheromatosis in rabbits with dietary hypercholesterolemia during a period of weight gain.

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Aspiration Biopsy of Bone Marrow in Diagnosis of Multiple Myeloma*

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THE first reported observation of an abnormal protein in the urine of a patient with pain in the back, chest and loins was made 105 years ago. The presence of this protein, the Bence-Jones protein, was soon associated with the malignant disease manifested by multiple tumors of bone consisting of proliferating elements of the marrow,[11] known commonly as multiple myeloma. The nature of the involved cells was for some time a subject of controversy. The tumor cells were variously identified and four types of myeloma were described[6]—the plasma cell type, the myelocytoma, the lymphocytoma and the erythroblastoma. Despite the fact that various types were reported, there was little difference in the gross appearance of the tumors or in the clinical course of the disease.

SINCE the introduction of sternal aspiration as a clinical diagnostic method, there has been a marked increase in the frequency with which the diagnosis of multiple myeloma has been made.[2] More recently, multiple puncture sites have been utilized. These include iliac crests,[14] spinous processes,[10] and ribs.[13] In the vast majority of cases, the type of cell described in the marrow has been the plasma cell or some atypical or immature form of this cell.[1, 5, 13, 15] In retrospect, it is apparent that much of the disagreement in the designation of the cell type has been due to difficulty in cytologic identification in tissue sections. Fine details may have been altered by fixation and staining, or by postmortem change. The present close agreement that the involved cell is related to the plasma cell is due to the use of the dry smear technic with Romanowsky stains, and the ease with which marrow can be obtained for study during life.

DIAGNOSIS OF MULTIPLE MYELOMA

VARIOUS cases of multiple myeloma present different features of the disease and few present all of them. Typical cases are not difficult to diagnose but when only one or a few of the usual abnormalities are manifest, they may focus attention away from rather than toward the underlying cause. Bayrd and Heck[2] summarize very well the chief clinical and laboratory abnormalities in their series of 83 cases of proved multiple myeloma:

*Presented at seventh annual meeting of the American Geriatrics Society, New York City, June 3, 1950.

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Per Cent	Abnormality	Per Cent	Abnormality
86	Pain	26	Evidence of osteoporosis
78	Multiple bone lesions	20	Hypercalcemia
73	Elevated serum protein	16	Pathologic fracture
61	Evidence of renal dysfunction	14	Paraplegia and root pain
59	Excessive rouleaux formation	12	Tumor formation
53	Anemia (11 Gm. Hb. or less)	12	No osseous abnormality by x-ray
53	Bence-Jones proteinuria	10	Myeloma cells in peripheral blood
41	Myeloid immaturity	7	Epistaxis

The most confusing conditions are metastatic skeletal lesions, hyperparathyroidism, spondylitis, nephritis and leukopenic leukemia. To provide definite diagnostic evidence, recourse has been made to surgical biopsy of a roentgenologically demonstrated lesion or to the examination of aspirated bone marrow.[3] The finding of "myeloma cells" in aspirated marrow has been regarded as pathognomonic of multiple myeloma. Further experience in the interpretation of bone marrow aspirations suggested that this point deserves revaluation.

Two major questions have arisen. The first is whether the "myeloma cell" is a separate entity found only in multiple myeloma or whether it is merely an abnormal or immature plasma cell. The weight of the evidence is in favor of the latter opinion. The second question is whether a diagnosis of myeloma can be based upon the percentage of these cells found in smears of aspirated marrow. That this is not a reliable criterion is attested by the observations reported here. Some of the cases of multiple myeloma have few or only slightly increased numbers of these cells, and on the other hand, there are cases with diagnoses other than multiple myeloma in which the smears of aspirated marrow contain a significant increase in plasma cells. Some of these cannot be differentiated morphologically from cells which have been identified as "myeloma cells."

PLASMA CELLS IN CASES OF MULTIPLE MYELOMA

TABLE 1 contains the essential features of ten previously unreported cases of multiple myeloma which, in most respects, are typical cases. The ages of the patients range from 44 to 79 years. In all but one instance, the sedimentation rate is markedly elevated. In nearly all, the total proteins and globulin are elevated. Bence-Jones protein is demonstrated in five out of nine of the cases. Only one lacks typical x-ray changes. The sex incidence is somewhat unusual, with the cases being equally divided between male and female patients. Typically, males are affected three times as commonly as females.[2] The number of plasma cells in smears of aspirated bone marrow is normally under one per cent, but in these cases, it ranges from two to 43.0 per cent. In a previously reported series two to 96 per cent plasma cells were found.[3]

PLASMA CELLS IN NON-MYELOMA CASES

LEITNER[9] records a report of 30.8 per cent plasma cells in the bone marrow in a case of lymphogranuloma inguinale (Gsell, 1939) and a report of 14 per cent plasma cells in a case of undulant fever (Loeffler and coworkers,

1943). Marschal and Mallet[12] describe the plasma cell reaction of cancer. They point out that over half of their cases with bone marrow metastasis had three to six per cent plasma cells and that they were often morphologically indistinguishable from the plasma cells seen in multiple myeloma. They report three cases of carcinoma of the prostate with metastasis in which 25 to 50 per cent plasma cells were found in the marrow. One of these cases had a serum protein of 13.3 gm. per cent. Often the diagnosis is clarified by finding aggregates of tumor cells in smears or sections of the marrow. If these are not found and the primary tumor has not yet been discovered, a mistaken diagnosis of myeloma might easily result.

Lanier[8] records two instances where diagnoses of multiple myeloma would have been entertained if only cytologic studies of the bone marrow had been available. In one, with 10.5 per cent plasma cells, the primary

TABLE I

PLASMA CELL MYELOMA

Sex and Age of Patient	Sed. Rate	Proteins T A/G	Bence Jones	X-ray	Plasma Cells
M 62	130	6.48 3.32 3.16	Neg.	Pos.	43.0%
M 48	125	8.80 2.66 6.14	Pos.	Pos.	42.0
F 47	157	12.88 1.86 11.02	Pos.	Pos.	41.5
M 45	136	12.72 2.59 10.13	Pos	Pos.	24.5
F 36	139	7.04 3.59 3.45	Pos.	Pos.	19.5
F 79	158	8.00 4.31 3.69	Neg.	Pos.	17.5
F 59	——	8.48 2.86 5.62	Pos.	Neg.	7.5
M 65	75	8.32 4.12 4.22	——	Pos.	6.0
M 44	162	13.20 1.99 11.21	Neg.	Pos.	2.5
F 61	17	9.76 4.52 5.24	Neg.	Pos.	2.0

tumor was an adenocarcinoma of the stomach; in another with 12.5 per cent plasma cells, it was a massive renal carcinoma.

The fact that there is an increase of plasma cells in and out of the bone marrow in certain diseases other than the primary plasmacytic diseases has been commented upon.[1, 7] Berlin and coworkers[4] studied the bone marrow in 33 persons with hyperglobulinemia and found that there was no correlation between the level of the serum globulin and the plasma cells in the bone marrow. Fadem and McBirnie[7] report the presence of a plasmacytosis of between 5.4 and 23.6 per cent in the bone marrow of six diseases other than the primary plasmacytic diseases. These were Hodgkin's sarcoma, lymphosarcoma, acute monocytic leukemia, primary "refractory" anemia, anemia due to a hiatal hernia, and papilloma of the bladder. They conclude that the demonstration of bone marrow plasmacytosis should be subjected to careful evaluation with consideration of other diagnostic criteria before the diagnosis of a primary plasmacytic disease is made. Diseases in which an increase in plasma cells in the bone marrow has been frequently reported are chronic infections, metastatic malignancy, Hodgkin's disease, leukemia, agranulocytosis, aplastic anemia and chronic hypochromic anemia.

The following case report illustrates the diagnostic problem presented by finding an increase in the number of plasma cells and the presence of immature and atypical forms in the bone marrow in an obscure case.

> The patient was a 46-year-old white male, who for ten months prior to admission to the University of Pennsylvania Graduate Hospital had intermittent, severe, "muscular" pains radiating from the dorsal region around to the abdomen. He also had fever, chills and night sweats. Several months after the onset, he fell, striking his right chest. Following this, he had pain and tenderness in his chest and pain in his lumbar region, radiating to the back of his legs. The chest pain became girdle-like. He developed malaise, anorexia, dyspnea and had a 30-pound weight loss. Repeated studies elsewhere revealed only a hypochromic anemia with a moderate leukocytosis and infiltration at both bases with a pleural effusion on the left. On admission to the hospital, he was found to have a temperature of 100.6°, fluid at the left base, tenderness of the chest wall in the right mid-axillary line, generalized abdominal tenderness most marked in the right upper quadrant and right flank. His right leg was edematous and tender.
>
> Laboratory studies revealed a moderately severe anemia, an elevated sedimentation rate, hyperproteinemia with an elevated globulin, and a slight increase in the serum bilirubin, then 0.8 mg. per cent. The test for Bence-Jones protein was negative. Determinations of calcium, phosphorus, acid phosphatase, serum amylase and lipase, and bromsulfalein were normal. The alkaline phosphatase was first reported to be elevated, 24.8 Bodansky units, but when the test was repeated, it was 3.6 units. Cephalin flocculation, thymol turbidity, thymol flocculation and serum colloidal gold were all normal, but the serum scarlet red reaction was plus three.
>
> Examination of the bone marrow revealed it to be cellular with the presence of 14 per cent plasma cells, many of which were abnormal and immature. Thoracentesis revealed bloody fluid, which, as shown by his-

tologic examination, contained no tumor cells. X-ray studies revealed no osteolytic skeletal lesions.

Because of the pain, the increased sedimentation rate, the hyperproteinemia with an elevated globulin, and the presence of an increased number of plasma cells in the bone marrow, with atypical and immature forms, a tentative diagnosis of multiple myeloma was made. Treatment with urethane was instituted. The patient was also considered to have a thrombophlebitis of the right leg and anticoagulants were administered. One week after admission to the hospital, the patient had an acute episode of dyspnea, cyanosis, tenderness and guarding of the upper abdomen. The possibility of a pulmonary embolus or a mesenteric thrombosis was suggested. After an initial stormy period, his symptoms subsided and he improved, but approximately one week later, he experienced pain in the left calf and evidence of a left thrombophlebitis was found. Following this episode, there was a gradual decline and the patient expired approximately one year after the onset of his symptoms.

Postmortem examination revealed a primary hepatoma with metastatic involvement of one lumbar vertebra. No evidence of multiple myeloma was found.

THIS CASE prompted us to review a group of approximately 150 unselected bone marrow aspirations upon which differential counts had been made. The following sixteen, the first of which belongs to the case report already cited, had more than three per cent plasma cells (Table II). No common denominator is apparent which would explain the elevation of plasma cells in these cases. In six, the presence of a malignancy was proved, but they did not all have evidence of bony metastases. In the case of pelvic inflammation and the case of exfoliative dermatitis, the increase in plasma cells could be related to the chronic infection. In the cases of Boeck's sarcoid and rheumatoid arthritis there was a definitely elevated serum globulin.

SUMMARY AND CONCLUSIONS

1. The bone marrow aspiration technic is a distinct aid in the diagnosis of multiple myeloma and has increased the frequency with which this diagnosis is made.
2. It appears that the abnormal cell in multiple myeloma is an atypical or immature plasma cell.
3. The designation of this cell as a "myeloma cell" should not imply that it is a separate and distinct entity since it has been demonstrated that abnormal and immature plasma cells of the type seen in multiple myeloma may be encountered in other diseases where it is not reasonable to postulate the coexistence of multiple myeloma.
4. The evidence obtained by examination of direct smears of aspirated bone marrow should be considered in conjunction with all of the available clinical and laboratory information in the diagnosis of multiple myeloma.

TABLE II

NON-MYELOMA CASES

Sex and Age of Patient	Diagnosis	Sed. Rate	Proteins T A/G	Plasma Cells
M 46	Primary hepatoma	84	8.72 3.06 5.66	14.0%
M 69	Carcinoma of esophagus	——	6.64 3.25 3.39	10.0
M 59	Hypersplenism	140	7.20 3.65 3.55	8.5
F 23	Pelvic inflammation	159	6.32 3.65 2.67	7.5
F 47	Carcinoma of cervix	——	7.92 4.05 3.87	7.0
M 56	Postoperative hemorrhage Syphilis	——	7.20 3.72 3.48	6.5
F 59	Exfoliative dermatitis	50	5.76 2.72 3.04	6.5
F 84	Carcinoma of breast	——	7.04 3.72 3.32	6.0
F 30	Boeck's sarcoid	——	10.00 4.05 5.95	4.5
F 49	Cord tumor?	60	6.64	4.5
F 25	Ruptured spleen	——	6.40 3.72 2.68	4.5
F 52	Cirrhosis	132	6.96 3.18 3.78	4.0
F 44	Carcinomatosis	——	7.44 3.65 3.79	4.0
F 61	Carcinoma of lung	101	6.72 3.72 3.00	3.5
M 55	Hyperthryoidism	——	6.72 3.32 3.40	3.5
M 25	Rheumatoid arthritis	159	8.00 2.99 5.01	3.5

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*Senile Obliterative Arteritis**

A. M. Boyd, F.R.C.S.

THE GREAT majority of patients who complain of symptoms due to arterial deficiency suffer from senile obliterative arteritis. The degenerative arterial changes are most marked in the lower limbs. A. M. Boyd, F.R.C.S., of Manchester, England, stresses that this condition may be found in all age groups. It is the most frequent cause of occlusive arterial disease between 30 and 40 and accounts for almost all cases of organic obliterative arterial change after 40.

Diffuse obliterative arteritis. The most characteristic arteriographic finding is the narrowing and irregularity of the main vessels with a beaded appearance of the larger branches.

Secondary popliteal thrombosis. Thrombosis of the popliteal artery occurs in nearly half the patients with diffuse arterial disease. One end of the thrombosed segment of the artery is usually at the knee joint. Repeated minor injuries caused by flexion and extension of the knee joint probably determine localization of the disease to this part of the vessel.

Secondary femoral thrombosis. Arteriography shows occlusion of the superficial femoral artery from the adductor opening, where thrombosis usually starts, to the point where the profunda femoris leaves the main trunk. The femoral vessel is often grossly deformed at the level of the adductor opening where the artery may be tethered to the margin of the tendinous opening.

Distal type. The distal type of senile obliterative arteritis, affecting the feet and hands, is seen principally in the third and fourth decades and after 70. Recognition of this group is extremely important because the sudden onset of ischemic changes in the feet of elderly patients is apt to be regarded as hopeless, whereas actually this type of arteritis responds dramatically to therapy.

*The diagnosis and pathogenesis of obliterative vascular disease of the lower extremities. Angiology 1: 373-390, 1950.

Post-menopausal Osteoporosis of the Spine

George M. Hart, M.D.*

OSTEOPOROSIS can be defined as that form of undermineralization of bone in which the primary defect lies in a hypofunction of the osteoblasts. Normal bone is composed of an organic matrix in which is deposited a calcium-phosphate-carbonate complex. During the life of the individual, two separate processes are constantly and simultaneously taking place upon the surfaces of the bone trabeculae: bone is being laid down and bone is being resorbed. In one phase of bone deposition the organic matrix is formed by the osteoblasts; in the other, the calcium complex is deposited in the matrix.

Considering these two processes of formation and resorption, it is readily seen that the mass of bone may be decreased by either an increase in the rate of resorption, as in osteitis fibrosa generalisata, or by a decrease in the rate of bone formation, as in osteoporosis or osteomalacia. If the osteoblasts fail to lay down sufficient osseous matrix, no matter how great a supply of the calcium-phosphorus-carbonate complex is present, osteoporosis results. Conversely, if the matrix, once laid down, is not calcified because of a deficiency of these elements, osteomalacia appears in the adult, or rickets in the child.

MORE DIFFICULT to understand, however, is the decrease in the activity of the osteoblasts in osteoporosis. Probably several factors are involved. For instance, there is considerable evidence that the stimulus for the osteoblasts lies within the stresses and strains to which the skeleton is put in normal activity. Thus osteoporosis follows immobilization of an extremity in a cast or prolonged bed rest. Osteoporosis accompanies the aging process in both men and women and coincides with thinning and wrinkling of the skin and atrophy of the hair and other tissues.

Another factor in women patients, demonstrated by Albright,[1, 2, 13] is the estrogen deficiency state of the post-menopausal period. In this condition, osteoporosis particularly of the spine and pelvis occurs. The long bones are involved to a lesser extent and the skull least of all. Patients in both physiologic and surgical menopause have been found to exhibit this type of osteoporosis.

Osteoporosis occurs in malnutrition where the normal protein requirements are not fulfilled and the bone matrix, like other tissues, is depleted. Still other causes are Cushing's syndrome, the adaptation syndrome of Selye[16] and acromegaly.

The characteristic history presented by a woman patient with osteo-

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porosis of the spine is somewhat as follows. The patient is usually in the fifties with a dull, aching, tired feeling in the lower dorsal or lumbar spine which may have been present for some years. Then a minor accident, such as striking a bump while riding in a car or a fall on the buttocks, precipitates a sharp severe back pain, intense enough to require bed rest for several weeks. From then on the patient becomes more aware of her backache. Sharp pains occur frequently with jars or bending and twisting movements. There may be referred pain up or down the spine or along the ribs into the anterior chest and epigastrium. Changes in the reflexes or in sensation are rare. Lifting, coughing and sneezing usually aggravate the pain; in some, the weather may have an effect.

Other symptoms are weakness, easy fatigability and nervousness. The patient may have a sensation that her back is likely to give way. Relief is usually obtained in the recumbent position. As the atrophy of the bone progresses, the patient notices that she is becoming round shouldered and decreasing in height.

Physical examination usually reveals many of the signs of senility, including generalized atrophy of the tissues, arteriosclerosis, and emaciation. The dorsal kyphosis causes the cervical spine to project forward, and this is compensated by an increase in the normal cervical lordosis. Tenderness to pressure over the spinous processes may be present particularly in cases with recent fracture.

In contrast to the above, an occasional patient may be remarkably well preserved, nourished and healthy except in regard to the back complaint.

REVIEW OF THE LITERATURE

A RELATIONSHIP between ovarian function and calcium metabolism has been recognized for many years. In 1916, Lawrence and Riddle[10] showed that there is more phosphorus in the blood stream of female than male fowls, also that laying hens have a higher blood phosphorus than non-laying hens. In 1926, Riddle and Reinhart[14] noted that the blood calcium level of female pigeons rose to as much as four times the normal about fifteen hours before the egg reached the shell gland. During the following three or four days the blood calcium fell to normal and remained there until the next ovulatory cycle began.

Macowan,[11] in 1932, correlated the degree of rise of the serum calcium level in the hen with the size of the egg. In 1933, Benjamin and Hess[5] demonstrated that the hypercalcemia present in ovulating birds was due entirely to an increase in the protein-bound, non-ionized calcium while the ionized fraction remained unchanged, thus providing a means of handling the large amounts of calcium necessary for egg laying. In 1934, Kyes and Potter[9] noted that hyperossification occurred in the marrow cavities of the bones of female pigeons before ovulation and receded after it. Following their observation, other investigators showed that ossification within the marrow cavities of pigeons, ducks and the domestic sparrow could be pro-

duced both in males and females by administration of estrogens. These changes were accompanied by the usual rise in blood calcium and subsided on withdrawal of the estrogen.

Gardner and Pfeiffer,[7] in 1938, working with mice, noted a similar response to estrogens and then demonstrated that administration of testosterone hindered the effect of estrogen.

In 1940, Albright, Bloomberg and Smith[1] described their first patient treated with estrin. The patient, given 1.66 mg. of alpha estradiol benzoate intramuscularly every other day and kept on a constant low calcium diet supplemented by weighed amounts of calcium gluconate, went into a markedly positive calcium and phosphorus balance which did not reach maximum until 20 days after therapy began. After therapy was discontinued, the effect persisted for about 15 days following which there was a slow return to the premedication level.

In 1944, Allen[3] studied the amount of various estrogens required to produce withdrawal bleeding in young castrated women with intact uteri. He stated that a dosage sufficiently great to produce withdrawal bleeding was necessary to control adequately menopausal symptoms in this type of patient. He found the required weekly dosage of estradiol benzoate to be 1.66 mg.; Stilbestrol, 3.00 mg.; and Premarin*, 12.6 mg. In 1947, Reifenstein and Albright[13] discussed the possible danger of producing carcinoma by prolonged administration of hormones.

In 1948, Sherman[17] reported the case of a 58-year-old woman with severe Paget's disease complicated by severe post-menopausal osteoporosis. Roentgenograms of the lower extremities revealed multiple fractures of the right femur and almost complete resorption of bone salts from the right tibia. X-rays made after 28 days of therapy with massive doses of estrogens revealed considerable callus about the femoral fractures and a definite increase in the density of the tibia. The patient was no longer bedridden and helpless but was able to sit in a chair and feed herself.

PHYSIOLOGY OF CALCIUM AND PHOSPHORUS METABOLISM

Calcium and phosphorus are absorbed from the alimentary tract and excreted in the urine and feces. The normal values for serum calcium in the adult range from 9.5 to 10.5 mg. per cent. The range for phosphorus is from 2.5 to 4.0 mg. per cent.

McLean and Hastings[12] have pointed out that there are two forms of serum calcium, one free and ionized, the other bound to protein and non-ionized. They have calculated the ionized calcium in the normal human to be 4.75 mg. per cent, a level which remains relatively fixed. However, the protein bound, non-ionized calcium fluctuates with variations in the serum protein level producing varying values of the total serum calcium, so that a patient with a low total protein has a relatively low serum calcium. Failure to recognize the protein-total calcium relationship could thus obscure an

*Conjugated equine estrogens, Ayerst, McKenna and Harrison.

actual hypercalcemia in cases of hyperparathyroidism with low levels of plasma protein. For example, the normal total serum calcium value with a total protein of four gm. per 100 cc. is only eight mg. per cent. A value within the usual range of 9.5 to 10.5 mg. per cent would indicate hypercalcemia in this patient. Conversely, it must be remembered that eight mg. per cent in the same patient does not mean hypocalcemia.

Normal bone is composed of an organic matrix in which is deposited a calcium-phosphorus-carbonate complex. Three types of surfaces are present: one where bone is being resorbed, one where bone is being formed, and one that is static. The body is able to form and resorb bone at the same time because of the presence of the enzyme, phosphatase, thought to be formed by the osteoblasts. Its presence where osteoid tissue is being formed increases the local concentration of phosphate ions by splitting them off from organic phosphate compounds, which in turn promotes the deposition of the calcium-phosphorus-carbonate salt. In the absence of hepatic disease, the level of the serum alkaline phosphatase is then an indication of the activity of the osteoblasts. The normal level in adults ranges from 1.5 to 4.0 Bodansky units per 100 cc. of serum.

As osteoporosis is by definition a disorder of the osteoblasts, no alteration in the serum calcium is expected. Since bone formation decreases and bone resorption continues at a normal rate, hypercalciuria may occur early in the disease before the skeletal stores of calcium are depleted. Thus during this phase of osteoporosis the same kidney complications are possible as in hyperparathyroidism.

Serum phosphorus is usually slightly elevated after the menopause and therefore is likely to be elevated in post-menopausal osteoporosis. Serum alkaline phosphatase is normal. This finding substantiates the belief that the osteoblasts are at fault, as a demineralized skeleton should stimulate osteoblastic activity producing elevation of the phosphatase.

In osteomalacia, on the other hand, there is plenty of bone matrix, but it is not calcified. Serum calcium is normal, serum phosphorus is decreased and alkaline phosphatase is elevated as the osteoblasts are active.

In older people the most common cause of osteomalacia is a gastro-intestinal tract disturbance with fat in the stools. This leads to faulty absorption of vitamin D, calcium and phosphorus which produces the osteomalacia.

Osteoporosis and osteomalacia may exist together in post-menopausal women who take a large amount of laxatives and do not absorb their fats or who have a gastro-intestinal disturbance with fatty stools. Such a patient would have a normal serum calcium and alkaline phosphatase and a low serum phosphorus

PATHOLOGIC CHANGES

Schmorl,[15] in 1931, described the gross and microscopic changes in the vertebrae in osteoporosis. In a study of several thousand spines examined at autopsies, he found the cortical bone to be much thinner than normal with

enlargement of the marrow spaces and medullary cavity. The individual trabeculae were much thinner and fewer in number. When the disease has progressed to sufficient degree, the bony trabeculae are no longer able to withstand the weight of the body, and collapse occurs in two ways: compression fractures of the vertebrae and ballooning of the discs into the central portions of the vertebral bodies.

Degenerative changes occur in the discs, particularly in the upper dorsal region, with thinning of the intervertebral spaces, hypertrophic spurs of the anterior margins of the bodies and production of an upper dorsal kyphosis. Ballooning occurs more frequently in the lower dorsal and lumbar regions where the discs maintain their expansibility longer.

ROENTGENOLOGIC CHANGES

THE x-ray findings are three in number and represent the changes which have just been described under pathology—that is, decreased density of the vertebral bodies, ballooning of the discs and compression fractures. Junghanns,[8] in 1931, noted that the vertebrae most frequently involved were those of the lumbar and lower dorsal spine.

Black,[6] in 1941, correlated the degree of osteoporosis with the number of ballooned discs. Of 18 patients with grade 1 osteoporosis (on a basis of 1 to 4), none had ballooning of the discs; of 47 with osteoporosis grade 2, 34 per cent had ballooning; of 45 with osteoporosis grade 3, 93.3 per cent had ballooning; and of 19 with osteoporosis grade 4, all had extensive ballooning.

Compression fractures were also proportionate to the degree of osteoporosis. Hypertrophic changes, however, were present in all groups and showed little relationship to the degree of demineralization present.

DIFFERENTIAL DIAGNOSIS

ATROPHY of the bone of the spinal column in post-menopausal women is not peculiar to osteoporosis alone. Other conditions may occur and present a somewhat similar picture and therefore must be differentiated.

Hyperparathyroidism produces osteoporosis which has been described by Bauer and Camp[4] as a miliary mottling and granular appearance of bone best seen in the flat bones. The skull is usually involved early, whereas in osteoporosis it is uninvolved. Bowing, cyst formation and fractures occur in the long bones. Serum calcium is usually elevated to 11 mg. or more per cent, and serum phosphorus is lowered. Serum alkaline phosphatase is increased. Urinary excretion of calcium and phosphorus is markedly increased, whereas only slight increases occur in osteoporosis and then only early in the course of the disease.

Hyperthyroidism may produce a roentgenological picture very similar to post-menopausal osteoporosis. The clinical history and physical findings, increased metabolic rate and a marked increase in the calcium excretion serve to differentiate the two. The degree of osteoporosis depends upon the

duration of the hyperthyroidism rather than the degree of elevation of the basal metabolic rate.

Metastatic malignant lesions may simulate osteoporosis. However, localized areas of destruction, invasion of the pedicles and the occurrence of similar lesions in the long bones give a clue as to the true nature of the condition. The sedimentation rate usually shows marked increase and in the absence of other causes for its elevation is diagnostic of generalized carcinomatosis. The blood smear may show immaturity of the myeloid cells, the so-called leukemoid reaction.

Multiple myeloma may produce osteoporosis of the spine, ballooned discs and collapse of the vertebrae. Usually lesions will be demonstrable in the ribs, pelvis and skull. Pain is more severe and persists even in the recumbent position, an unusual feature in osteoporosis. Increase in the non-protein nitrogen, albuminuria and Bence-Jones proteinuria aid in the differential diagnosis. Sternal puncture can be done when the diagnosis is not clear.

Rheumatoid arthritis may produce osteoporosis of the spine. Whether it is due to the arthritis or is a disuse atrophy is difficult to say. The typical history of sore, stiff, swollen, reddened joints in a young adult with anemia, increased sedimentation rate and destructive changes in other joints serves to make the diagnosis clear.

Osteomalacia, the adult equivalent of rickets, is due to an inadequate intake or absorption of calcium, phosphorus, and vitamin D. Osteomalacia associated with pregnancy is rare in this country but is endemic in certain parts of China and India. Nutritional deficiencies with increased fat in the stool may preclude proper absorption of these elements and vitamin D with subsequent development of osteomalacia.

The changes in the spinal column are similar to those found in osteoporosis, but there is usually distortion of the pelvis and involvement of the long bones. In addition, symmetrical areas of decalcification or pseudofractures, the so-called "Looser zones," occur. Serum phosphorus is usually lowered and alkaline phosphatase is slightly elevated. As mentioned previously, osteomalacia and osteoporosis may occur simultaneously.

THE ROLE OF THE ESTROGENS

Reifenstein and Albright[13] reported in 1947 their findings on the metabolic effects of the steroid hormones in osteoporosis.

Two forms of estrogens were used: estradiol benzoate and diethylstilbestrol. Urinary and fecal excretion of calcium and phosphorus were decreased by both hormones. Diethylstilbestrol appeared to be fully as effective as the naturally occurring estrogen, estradiol. Effects usually were apparent within six days but did not reach a maximum until after 30 days and lasted for 30 to 50 days after therapy was discontinued. Serum phosphorus levels, which tend to be slightly elevated in post-menopausal patients, fell in almost all of the patients studied. Serum alkaline phosphatase levels failed to rise as had been expected.

Progesterone was administered both alone and in combination with one of the estrogens. It had no definite effect on calcium balance.

The androgens, testosterone propionate and methyl testosterone, had a similar effect on calcium and phosphorus excretion as did the estrogens. Both urinary and fecal excretion were decreased. Both forms appeared to be equally effective. Serum phosphorus levels tended to fall, and alkaline phosphatase failed to rise as it had with the estrogens. A marked decrease in urinary nitrogen excretion was noted which had not occurred following estrogen administration.

The effects of combined estrogen and androgen therapy on calcium metabolism were found to be greater than when either was used alone. Because this effect was so definite, it is the practice of these authors to administer combined therapy to most of their patients for the first six to 12 weeks.

Sodium retention with resultant edema was found to occur in some patients following endocrine therapy, especially if they had low serum proteins. In most patients this was controlled by a low salt diet and ammonium chloride.

TREATMENT

TREATMENT of osteoporosis of the spine can be classified under three headings: (1) hormonal therapy, (2) supplementary dietary measures and (3) supportive devices.

Dosages of estrogens should be great enough to produce withdrawal bleeding in castrate women with intact uteri as described by Allen.[3] Because administration is carried on over long periods of time, dosage should not be excessively high. Furthermore, there is no convincing evidence showing that high dosages are more effective. In the case of estradiol benzoate, 1.66 mg. intramuscularly once or twice a week usually is adequate. With diethylstilbestrol, 0.5 to 1.0 mg. daily is recommended. If Premarin is used, 2.5 mg. daily should be administered.

When the androgens are used, testosterone propionate dosage is from 25 to 50 mg. intramuscularly and methyl testosterone from 40 to 100 mg. orally daily.

According to Reifenstein and Albright,[13] combined estrogen and androgen therapy should be carried out for the first two to three months.

Because of the possible carcinogenic effect of prolonged estrogen therapy, it is the usual practice to interrupt medication every four to six weeks for one to two weeks, even though the uterus may not be present.

When the uterus is intact, a record of any vaginal bleeding should be kept, and any bleeding not explained by estrogen withdrawal should be investigated. An examination of a vaginal smear may be done every six months as a further safeguard.

Supplementary dietary measures should include a high protein diet since osteoporosis is due to a deficiency in the formation of bone matrix. Vitamin D, phosphorus and calcium should be adequate in the diet, but excessively

high intake is not necessary as the pathology does not lie in abnormal mineral metabolism. If evidence of sodium retention occurs, a low salt intake and ammonium chloride will usually control symptoms.

Supportive devices are frequently of considerable value in relieving pain. Either a Taylor back brace or a high corset with shoulder straps and stays may be used. In an occasional patient with considerable deformity and radicular pain, spinal fusion may be indicated.

PROGNOSIS

PATIENTS with post-menopausal osteoporosis of the spine who are treated with estrogens or with estrogens combined with androgens can look forward, as a group, to considerable relief from pain. Within weeks to months pain in the spine is usually considerably or completely eliminated. Most patients also experience a gain in weight, an apparent increase in thickness of the skin and a generally improved sense of well-being.

With the exception of the patient reported by Sherman[17] with Paget's disease complicated by osteoporosis, no case was found in the literature where definite proof of increased deposition of bone salts occurred in the bones following estrogen therapy.

The following typical case report demonstrates the marked relief from pain following adequate estrogen therapy in a housewife who had been largely incapacitated for a period of two years.

> The patient, aged 53, first complained of sudden dorsal and lumbar backache in November, 1947, after lifting a heavy object. She was confined to bed for a period of two months and then gradually became ambulatory but was unable to do any of her housework.
>
> When seen in September, 1949, she was having an exacerbation of back pain which had required bed rest for the previous week.
>
> Physical examination showed an increase in the dorsal kyphosis and flattening of the lumbar curve. Percussion over the spine elicited tenderness in the lower dorsal and lumbar regions. Forward and lateral bending were moderately limited. X-ray examination (see Figure 1) revealed marked demineralization of the vertebrae, ballooning of the lumbar intervertebral discs and slight compression of the bodies of T7 and T9. Serum calcium was 10.8 mg. per cent and serum phosphorus was 3.3 mg. per cent.
>
> For the previous 24 months the patient had been taking 1.25 mg. of Premarin every other day. As this dosage was considered inadequate, it was discontinued, and 0.5 mg. of diethylstilbestrol were administered daily for 30 days. Within four to five days she experienced marked relief of pain, but tenderness over the spine and limitation of motion persisted. After 30 days of therapy medication was discontinued for a period of two weeks. At this time she reported continued improvement and was able to do light work around the house.
>
> Medication was again administered for one month followed by a two week rest period. By this time the patient was completely free of pain for the first time in two years, was doing all of her housework including washing and ironing and was driving the family car.

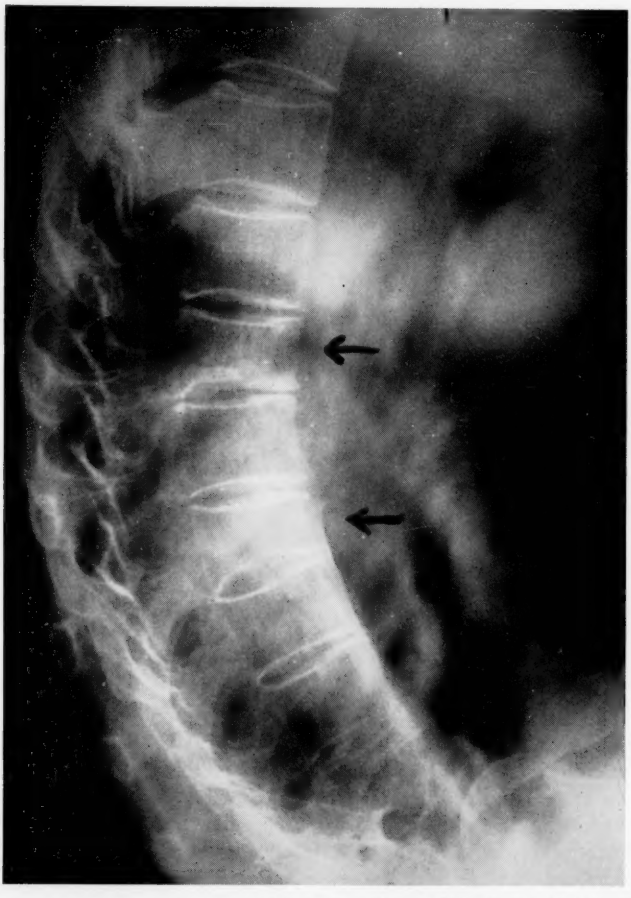

Figure 1. Lateral x-ray of dorsal spine showing marked demineralization of the verterbae, ballooning of the discs and slight compression of bodes of T7 and T9.

SUMMARY

The literature concerning post-menopausal osteoporosis of the spine has been reviewed. The chief symptom is usually pain in the lower dorsal and lumbar spine and frequently there is a history of sudden aggravation following a minor jar or injury. Laboratory examination is not remarkable with the exception of a slightly increased serum phosphorus in some patients. X-ray examination of the spine typically reveals a decrease in density of the dorsal and lumbar vertebrae, ballooning of the lower dorsal and lumbar intervertebral discs and compression fractures.

Treatment with estrogens or estrogens in combination with androgens can be expected to afford relief from pain in a high percentage of patients.

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*Khellin for Angina Pectoris**

Charles A. Armbrust, Jr., M.D., *and Samuel A. Levine*, M.D.

Need for a long-acting coronary vasodilator may be met with khellin if nausea, anorexia, and dizziness, side effects which occur in almost two-thirds of the cases, can be controlled. The drug, isolated from the fruit of *Amni visnaga*, a Mediterranean plant, has definite value in angina pectoris and is used as a mixture consisting of 70 to 80 per cent khellin and 20 to 30 per cent visnagin.

The effect is more prolonged than that of nitrites. The material is rapidly absorbed after intramuscular injection, disappears slowly, relaxes smooth muscle, and has a selective action on the coronary vessels.

Since khellin has a cumulative effect, an initial dose may be given to obtain an effective blood level and then a lower daily dose employed. Charles A. Armbrust, Jr., M.D., and Samuel A. Levine, M.D., of Harvard University, Boston, found that 29 of 53 ambulatory patients with angina pectoris were benefited by oral doses of 40 mg. three times daily. Fewer nitroglycerine tablets were used, attacks were less frequent and milder, and the patients could walk greater distances than previously. When placebos were substituted for khellin, anginal attacks returned or increased in severity within two to four days. Side effects usually showed up in the first week of treatment but were ordinarily eliminated by decreasing dosage. A few patients, however, are unable to tolerate the medication.

*The treatment of angina pectoris with a preparation of khellin (Amni visnaga). Am. J. M. Sc. 220: 127-132, 1950.

Ambulatory Care of the Aged*

Malford Thewlis, M.D.† *and E. T. Gale,* M.D.††

PREVENTIVE geriatrics, which may well begin at 20, is applicable to the care of ambulatory patients. It includes a study of the patient's susceptibilities to disease and an endeavor to prevent diseases likely to occur. Indigestion cannot be overlooked in persons whose family history includes ulcer, nor obesity in diabetic families, nor overweight against the arthritic background. Stress and strain in hypertensive families is detrimental, but may be lessened by timely guidance.

The clinical picture may be blurred. There is no way of knowing why some persons deteriorate mentally without cerebral arteriosclerosis; or why some with marked cerebral arteriosclerosis have no mental symptoms. Cerebral atrophy may exist without severe arteriosclerosis. There must be complex causes: heredity, focal infection, poor nutrition, or stress.

Geriatrics proper begins at 40; even then we are concerned with the prevention of diseases which may occur at 60 or 70. Preventive measures include mental hygiene, healthful environment, adequate nutrition, avoidance of obesity, and correction of focal infection. Work, exercise, fresh air, and recreation are also helpful.

ORGANIZED HOME MEDICAL SERVICES

THE PHYSICIAN should not focus on one phase of the care of the aged patient but should consider a combination of services—a combined geriatric program. There must be cooperation and coordination of all agencies dealing with the aged.

Organized home medical services have been improving so that there are now many such plans functioning in various parts of the country. The first plans for home care were from the New York Dispensary in 1794 and the Boston Dispensary in 1796. In the Boston area, the dispensary has supplied home care for years; the city of Boston has no city physician and the dispensary supplies care to acute illnesses and to chronic ones as well. A medical supervisor arranges for free care to patients who are unable to go to the clinic or who are unable to employ a physician. Graduate physicians, who have had one or two years internship and who are taking credit for two or three years to meet board requirements, go to the bedside and are responsible for the care of the patient. Each graduate working under the direction of the district physician acts as a preceptor for fourth year medical students for one month. In this way the entire city is used as a teaching service.

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*Read before the sixth annual meeting of the American Geriatrics Society, Atlantic City, N. J., June 3, 1949.

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Forty per cent of this care is for acute respiratory tract infections, cardiac disease, and rheumatic fever. Bedside care is followed by calls by visiting nurses. There is also a full time social worker attached to the unit.

In New York City, Montefiore, St. Barnabas, and Bellevue hospitals have home care programs for chronic illnesses. There are similar programs in Syracuse, a housekeeping service in Cleveland, and special services for the chronically ill in Chicago and Philadelphia. The public health service is cooperating with many of these plans.

Bluestone, of Montefiore Hospital, New York City, was one of the pioneers in the field of home medical care. Cherkasky, home care executive of this hospital, showed that the scientific machinery of his institution has been made available to patients in their homes, including twenty-four hour medical service, with specialists of all kinds, social service, nursing, housekeeping service, transportation, and medication. Also available are hospital beds, wheel chairs, special mattresses, and braces, occupational and physical therapy. Cherkasky found that the average cost per day for such services was $3.00 in contrast to hospital costs which run from $12 to $15 a day. He found this home care in selected cases was "infinitely better" than hospital care.

PRIVATE CARE IN HOMES, CLINICS, OR OFFICES

Perhaps not more than one in a hundred old persons needs institutional care. In our diagnostic clinic we have found that patients who have access to portable x-ray and other laboratory equipment have less need for institutions. This is as it should be; hospitals are filled with patients who could be cared for elsewhere—at home or in the physician's office.

Patients with chronic illnesses create financial problems for the family and for the physician. Expenses are less, of course, if a member of the family or a relative can provide the care, but sometimes the illness is so prolonged and the patient's demands so great that the family is worn out. The cost of nursing and domestic help is great; an institution, therefore, may be the easiest solution.

Our clinic is for diagnostic purposes only. During the past year we have entered into local hospitals only 19 patients over 50 years of age for medical (not surgical) care, a small number compared to the total of elderly people seen during the year. Division of the 19 patients' diagnoses was as follows: 1 with cerebral hemorrhage; 3, pneumonia; 1, coronary infarction; 1, coronary artery disease; 1, diabetic acidosis; 4, cancer; 1, peri-tonsillar abscess; 1, congestive heart failure; 1, brucellosis; 2, malnutrition; 1, pancreatitis; and 2, empyema of the chest. These patients were admitted because: 2 were unmanageable and confused; 8 were acutely or seriously ill; 4 were living alone; and 5 needed more attention than was available in the home. We are of the opinion that the reasons why there are so few hospital entrances are: non-directive counseling, work for the aged patient, concentration on prevention of disease, and special attention to the correction of anemia and nutritional deficiencies.

AMBULATORY ILLNESSES

IT IS SAFE to say that 95 per cent of illnesses are self-limited; recovery takes place spontaneously. While perhaps 4 per cent of the patients may require more specific treatment, only 1 per cent will require hospital care. This varies, of course, according to local conditions and the type of practice the physician has developed. Some physicians may find that a much larger number of patients require hospital care. The majority of illnesses in the aged, however, are ambulatory.

Arthritic patients can often get along at home without hospital care. As a matter of fact, hospitals are so crowded that very little care is available for such patients when competing for attention with those who are seriously ill and suffering. It is not our purpose to undervalue hospital service: we would like to see more hospitals available to sufferers from acute illnesses rather than institutions overflowing with patients who could be cared for at home.

INSTITUTIONAL TREATMENT OF CHRONIC DISEASES

THERE ARE certain types of patients which are best treated in a hospital or institution, temporarily or indefinitely. Usually the patients will be: (1) those who need help to get out of bed; (2) those who are too weak or ill to feed themselves; (3) those who have incontinence of urine and feces; (4) those who live alone and need someone to prepare meals; (5) those who are seriously ill and do not respond quickly to treatment; (6) and those requiring surgical attention.

There is need for hospitals with special wards for the care of chronic diseases. General hospitals are better equipped for such work which includes psychiatric treatment, physical therapy, occupational therapy, and a general therapeutic program. Brief psychotherapy will take care of the majority of cases. This actually means listening to personal histories and reassuring patients. The average physician is a fairly good psychotherapist. If he inspires confidence, his very presence helps the patient; if he does not impart hope and good cheer, he is failing as a clinician.

There is a shortage of technicians interested in physical and occupational therapy. However, some old persons can be trained to give massage and to teach some forms of occupational therapy. Others are needed to carry on the educational program.

Work for the aged is one of our best weapons against mental decay. Why not utilize old people in institutions to help in the care of other patients? Many of them could work in the kitchen, garden, or do some practical nursing. Why not pay them for their work? They would be proud of their spending money, even if it were only a small sum.

Perhaps some old people could be housed in cubicles in buildings: a private home within an institution. One could even dream a little more and see a door leading outdoors from each cubicle to a small garden where the old person could sit or work in the summer. The actual care of these people

could be, in part at least, their own responsibility. Some elderly people could wait on others who are less able to care for themselves.

The geriatrician could make regular visits on aged patients, or better still, hold a clinic once a week or twice a month. Social workers could work out programs for these patients, including entertainment, and train one or two old people in the institution to carry out her plans.

SOME THERAPEUTIC CONSIDERATIONS

MEDICAL care of these patients should be gentle and not overactive. One can easily produce a good deal of collateral thinking in these elderly people by digging up symptoms.

As mentioned before, one must be content with partial adjustments. Old people often have many ailments—perhaps five, or six, or more. Naturally they have to live with their ailments since not all their problems can be solved. Some diseases (for example, arthritis of the spine) may become asymptomatic for some time. But the patient will not quiet down if the physician is over-attentive.

The moment the physician is overambitious or practices "Army medicine," applying vigorous therapeutic methods to the aged, the mortality rate increases. Take, for example, an old person who is acutely ill with a severe respiratory tract infection. If the physician is not a good geriatrician, he may make a hasty, mistaken diagnosis of pneumonia, upset the patient and family, and throw the whole household out of gear. The gentle geriatrician—and he must be gentle or he is not an adequate geriatrician—goes about his task quietly, gives 300,000 units of penicillin daily for three days; in three or four days the old person may be well again.

SHOULD NORMAL OLD PEOPLE ENTER STATE MENTAL HOSPITALS?

OLD PERSONS who have no families, who need supervision and who cannot take care of themselves are often sent to a state mental hospital, despite the shortage of hospital beds and the fact that many of these institutions are not equipped to provide satisfactory medical care, diet or treatment for the aged.

It would be easy to criticize the limitations in the therapeutic requirements of these patients; one could easily think of a thousand things which could be done. But sometimes one does well with intelligent neglect. Surely, many such patients, without medical care, may live longer than they would with the wrong brand of it.

OLD AGE COMMUNITIES

A DREAM for the care of the aged would be a center somewhat similar to a group of roadside cabins. Here aged people, or aged couples, would live simply in cabins, each equipped with a kitchenette and a shower bath, which is easier for the older person to use than a bath tub.

A central heating plant could be installed and a central building provided for dining room and recreation. Here the old people could congregate for entertainment: games, lectures, radio, television, or conversation. The cost of operating such units would not be much more than the cost of old age pensions.

A group of low-income people could share a center. A project could be financed and small homes made available for purchase to old people who could invest their savings constructively for themselves. Such a development could have its own facilities, even a small store, a small library, and a recreational building. Certainly someone with executive ability and good will could work out a desirable program.

NURSING, CONVALESCENT AND BOARDING HOMES FOR THE AGED

NURSING homes operated by practical nurses with one trained nurse in charge can be utilized for general care of the aged. They are useful and many of them are efficient. Convalescent homes, where patients are sent to recuperate after surgical operations or medical treatment, are necessary to relieve hospital congestion. Although there is a tendency for some people to make a racket out of boarding elderly people, there are many private institutions where the aged receive good care at a reasonable cost. They are operated by people who really like the aged; every consideration is given to these elderly persons—good food, comfortable quarters, efficient medical care, and entertainment.

NUTRITION

OLDER people who are on a rounded diet have less illness than those who are not. The majority of elderly people we see are on a diet deficient in calcium and vitamin C. One can judge if the diet is adequate by figuring out the intake of proteins, calcium, and ascorbic acid. The condition of the tongue, skin, the weight, and the mental state will show if there is proper food and normal absorption.

The average old person needs a pint of milk daily and 8 ounces of citrus fruit juice to provide adequate calcium and vitamin C intake. Green-leaf vegetables and milk supply both calcium and vitamin A. Milk is also a good source of riboflavin and phosphorus. The daily requirement of calcium is one gram, and 0.88 gm. phosphorus is the normal maintenance amount in health.

Adequate proteins are required to maintain normal metabolism; this is important even in the prevention of decubitus ulcers or fractures. Vitamin C helps the synthesis of proteins. Insufficiency of proteins and vitamin C will cause edema of the tissues or even changes in bones. Inactivity is the most frequent cause of osteoporotic changes, however.

A rounded diet plays an important part in the mental state of the patient. Inadequate protein intake may even cause mental symptoms. Vitamin B deficiencies have been spoken of as a cause of mental confusion. However, vitamin B is only one factor of the equation; as a rule it is a general deficiency which causes trouble.

Overeating is one of the most important geriatric problems. There is no doubt that obese persons have a shorter life span and are more susceptible to more diseases than the lean.

Institutions can solve part of the vitamin B and C deficiencies by using Sunway dehydrated orange juice which has been fortified with B and C vitamins. A gallon costs 64 cents and 8 ounces a day give 1.0 mg. thiamine chloride, 120 mg. ascorbic acid and 116 calories.

Dry skim milk powder is an inexpensive source of proteins in institutions and at home. One ounce of dry skim milk powder contains 10.5 gm. protein, 15 gm. lactose, 0.25 gm. fat, 0.37 gm. calcium, 0.29 gm. phosphorus, 0.25 mg. niacin, 0.10 mg. thiamine, 0.60 mg. riboflavin, and 102 calories. It is low in fat and vitamin A. Three ounces of this powder are required daily for the average old person but it may be increased during illnesses.

CONCLUSIONS

A large percentage of illnesses in old age is of an ambulatory nature; only one in a hundred patients needs institutional care. The problem is how to treat these aged people to keep them out of hospitals. This is the role of preventive geriatrics.

A preventive program includes mental hygiene, psychotherapy, care of focal infection, and adequate nutrition. Physical therapy for hemiplegia is needed. Early ambulation is necessary after any illness and after surgery. Adequate proteins, calcium and vitamin C are the main features of an adequate diet. Overeating should be avoided especially at the evening meal. Obesity is always a danger. Preventive geriatrics begins at 20; actual geriatrics begins at 40. The term geriatrics covers the causes of aging; also prevention and treatment of diseases of advancing years.

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GERIATRICS

Official Journal of the
American Geriatrics Society

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Gerontocracy

THE term *gerontocracy* pops up to describe leadership in some nonexistent hypothetical state where a group of elders rule. Nothing could be more antithetically descriptive of our times. There may have been a period in the affairs of ancient Greece, or possibly in the early traditions and workings of the Sanhedrin among the Hebrews, where the term could represent an actual condition of government. It is not that we now lack the material for the selection of such groups to exude wisdom, as well as guidance. Blocks of elders, such as our Townsendites, would be quite willing to rule, but failing to attain that state, are willing to increase their security and pensions through political pressure. But whatever is gained thereby is antidoted by the chagrin that most elders feel when they are forced into retirement, reserving little voice in directing their own destiny.

While our population was more rural than urban, and before mass production flowered, both in industry and on farms, the problem of premature retirement was not so obvious.

The movement for the care of the aging with its pensions and forms of assistance is too new in our Western civilization for the establishment of the necessary basic concepts. It must be understood and, in fact, underwritten by members of all the various age groups. If we interpret Oriental customs and traditions correctly, a system which might well be termed "gerontocracy" has obtained for centuries among the family groups in rural China, where the first consideration of the dutiful son is the care of the dominating father. Granting that this filial devotion stems primarily from the uncertainty the son has in terms of his own security in old age, it would seem that our completely impersonal approach not only puts a very disproportionate emphasis on dollars that vacillate in value but actually tends to disrupt the ties of personal and family responsibility. Every social worker sees this happening. We are building up a vast army of displaced

elderly people. While it is true that a few Baruchs and Stimsons are used in high places, big business, aggressive unions and government itself, our civilization as a whole shows little evidence that a "council of elders" is encouraged, not to say tolerated.

Senator Thomas E. Desmond, of the New York State joint legislative committee on problems of the aging, has been doing effective work for years, pointing to the fallacies involved in the displacement of so many men and women still able to contribute wholeheartedly and wholesomely to the purposes of national economy. Within the arts, trades and professions, the loss of skills and wisdom inherent in the older, highly trained men and women is particularly noticeable, since these would not represent such a threat if it could be said with assurance that younger people were equally schooled in the disciplines of the much discussed *"individual initiative and enterprise."*

If this reverberative political slogan means anything, in the light of presently observable facts and tendencies in our society, perhaps we should read it in reverse English. Thus interpreted it should include indoctrination of our sixty-odd million who are getting ready to become old in the acceptance of pensions, retirement and displacement; indoctrination in adjustment to the status children used to have in the community of our ancestors, except that these new children are to be neither seen nor heard.

E. L. TUOHY, M.D.

*Gerontion**

. . . Vacant shuttles
Weave the wind. I have no ghosts,
An old man in a draughty house
Under a windy knob.

—*Gerontion*, T. S. ELIOT

T. S. ELIOT in his poem "Gerontion" gives an impressive description of senility. It is a picture of utter defeat. It is a disease that begins with amiable acceptance of the idea that the old have had their day so that when retirement comes the busy man is glad to leave his business to spend the rest of his life in ease and amusement. With no imperative duties and nothing much to look forward to, he potters about and lives in the past; from disuse his faculties soon begin to atrophy and this attitude becomes fixed into an irreversible change. Fortunately, this is not as yet a common disease, but under the increasing stress of overpopulation and Marxian principles it may become so. That it is largely avoidable is the justification for geriatrics. This attitude to old age is based on a false assumption; that the battle is for the strong is only true of the jungle. If we believe that life is the expression of a purpose, fulfilled in many ways, in which the young, the middle-aged and the old all have their part to play, the final touches being essential for its completion, no one of whatever age need be obsessed by a sense of his own futility. While it is desirable that aging people should respect their limitations and be aware of the hazards of old age, the aim of geriatricians should be to impress them with their abilities rather than to emphasize their disabilities. As abilities depend very largely upon the condition of the cardiovascular system, the problem of the aging heart is of crucial importance.

*Editorial, "The Aging Heart," reprinted from Internat. M. Digest 57:246, 1950.

The American Geriatrics Society 8th Annual Convention will be held at the Hotel Brighton, Atlantic City, New Jersey, June 7, 8, 9, 1951.

*Socio*medical Progress

Devoted to constructive correlation of interrelationships between sociological and medical problems in the aged. . . .

The Church in Community Planning for the Aged*

Paul B. Maves, Ph.D.†

WHEN HEALTH is thought of as more than the absence of symptoms, more than unobstructed somatic functioning, and when one begins to think about the whole person in relation to his total environment, religion inevitably comes into the picture. Because of its interest for the whole person, religion is deeply concerned with health in all of its manifestations. The words "health," "whole," and "holy" all come from the same root, testifying to the ancient vestment of the functions of medicine man and priest in one individual. It is only during the last few centuries that the professions dealing with the body, mind, and spirit have become so completely separated. Undoubtedly this separation was necessary, for many of the tremendous strides made in scientific technology have come about as a result of specialization. However, it is now becoming increasingly clear that further advance depends upon a reintegration of the specialized professions which serve man.

Gerontology and geriatrics are setting the pace in a field approach to the problems of later maturity. It is in this field that we see most clearly the relation of faith to health. Without a reason for living, health is useless and soon breaks down. Without a reason for living that integrates a person with society, psychological conflicts arise. The psychotic and the delinquent may have compelling goals in life, but no one would consider them healthy. When we think about the conversion of such persons into normal individuals, the resources of the church, the social agency, and the medical clinic are all needed.

It is quite practical that the church be represented on the geriatric team, provided it wins a right to be there through its own understanding of the aging process and its competence in helping older persons to find meaningfulness in later maturity. Those who practice geriatric medicine, and who are at the same time members of the church, might help prepare the church and the clergy for membership on the team. By the term "church" is meant the institutionalized expression of religion in the Judeo-Christian tradition.

What role would the church play on the geriatric team? How would the church contribute to community planning for the aged? In order to answer these questions let us analyze briefly the functions of religion.

*Read at the seventh annual meeting, American Geriatrics Society, June 3, 1950, New York City.

†Assistant professor of religious education, Drew University, Madison, New Jersey.

First, religion attempts to come to terms with ultimate reality and to discover meaning in life. It represents the search for ultimate values. It holds that persons are of more value than property, that love is better than hate, that man is an end in himself and not a means, that the individual is the end and the institution the means. It is religious faith, not science, which affirms that the geriatricians' quest is worth while.

Second, in the attempt to come to terms with reality, religion faces the limitations of life and attempts to find meaning in disease, disability, delinquency, and death. It acknowledges finiteness and seeks to enable persons to live with mystery through faith. Gotthard Booth, a psychiatrist, has remarked that science can help us to realize and to use our potentialities, but it cannot help us to accept and live with our limitations. The man who is dying of cancer needs more than sedatives to enable him to come through that experience without despair.

There is some disposition among scientists to refuse to accept limitations or to regard mystery as final. Happily for us, the scientist keeps hammering away at the barriers of the unknown; and for that he should be honored and encouraged. There is necessarily a tension between the struggle for control over nature and the need to accept our limitations. Who knows when we will eradicate all disease, or how far we can prolong the span of life?

Third, religion provides a channel for the expression of our gratitude for life's innumerable blessings, and enables us to celebrate our joys and our triumphs with all the artistic skill at our command, recognizing that many of these gifts come unsought and unearned. Among these gifts are the gifts of life and love. In many ways ours is a complaining, negative age, a cantankerous and critical period of history. It thinks of rights more than responsibilities. In this respect it is an infantile and an irreligious age. Do we not need to celebrate the advantages and compensations of later maturity as well as to complain of its losses, to elevate its potentialities as well as to lift up its problems? Religion can provide the symbols for that.

Finally, religion binds men together in a common commitment to values which it then attempts to make operative in human life. Inevitably a religious view of life gives rise to a fellowship, and this fellowship becomes structuralized in an institution with its creedal statements, ceremonies, and patterns of conduct which express the values to which it is committed. Religion not only gives life meaning but also makes society possible.

The problems of our time root in conflicts of values. Growing older is certainly complicated by the fact that in our acquisitive society men are valued for their productivity. This puts older people at a disadvantage. The physician may feel a little guilty about prolonging a life which is no longer of any use to its fellowmen in terms of economic productivity, or, worse, is an economic burden upon society. But religious faith says that a man is of intrinsic worth in himself because he is a child of God, and finds that one can be creative in terms of human values even when he can no longer be productive of economic values. The older person is not devalued due to loss of social status, lack of material success, lack of intellectual or artistic achievement, or deficiency of native endowment.

With this analysis of the function of religion we can now outline the role of the church in relation to community planning.

To begin with, the church has a goal-setting and value-setting function which may give impetus, purpose, and direction to community planning. This may operate indirectly as the members of the church bring their ethical ideals into their responsibilities as citizens. It may work directly as the church takes the lead, perhaps with the counsel of such experts as geriatricians, in evaluating community patterns and resources in their effect upon older people and in suggesting desirable goals.

In the second place it may take the initiative in stimulating community planning in order to implement the goals and values it cherishes, so that community relations will not be in conflict with the quality of the relations which exist within the inner community of the church. It recognizes that the community as well as the church school is an agency of religious education, and that for maximum effectiveness they need to work together. Many clergymen have some training in community organization, and therefore social conditions can be analyzed and evaluated from the standpoint of their effect upon the goals and values of religion.

In one community, for example, the clergyman working quietly behind the scenes encouraged the formation of a county hygiene association of all interested workers and a community planning council representing all organizations. In his relation to his parishioners he was constantly interpreting the function of health agencies. As a community leader he took part in the fight for more adequate public health resources.

Thirdly, the church may cooperate with other agencies in securing the necessary resources which older people may need to handle their conflict creatively, to resolve their tensions successfully, to achieve satisfactions adequately, and to find support and security. Such agencies include counseling centers, referral agencies, hospitals, homes, recreational facilities, and home care services. Church groups may also study housing and social security with a view to their responsibility.

In other words, the church does two kinds of things in relation to the community. (1) It does those things which it is uniquely fitted to do by its very nature and which it cannot escape, if it is true to its function. Such things include opportunities for worship, pastoral care, and religious education. The church has an affirmative framework of meaning which it seeks to make available and relevant to all persons everywhere. This it has to do, and this has direct bearing upon health in later maturity.

(2) It does those things which need doing and which it chooses to do because no other agency is doing them or because it is in a better position to do them than any other agency at that particular moment. So the church has been in the forefront of building and operating hospitals and homes and social welfare agencies of various kinds. The church has promoted recreational programs and counseling services. If it becomes clear that other agencies can do these things more effectively, the church is willing to see other agencies take over, but it is concerned that when other agencies do take them over, they continue to put persons and the integrity of persons first. It is also concerned that these agencies do not use these programs to foster anti-religious attitudes or to exclude the essential ministries of religion unless these ministries in their turn are misused.

Let us consider how this collaboration might work out in relation to a typical case whom we will call Mrs. Jones. Her physician, who has a geriatric orientation, sees to it that she knows what things she ought and ought not to eat, prescribes vitamins and other essential nutrients. He suggests what activities are within the range of her strength and capacities. When she falls ill he sees that she is admitted to the proper medical facility and receives the needed treatment, calling upon the proper specialists and auxiliary professions as the need arises. When it becomes clear that she is chronically ill, he may suggest that she now needs terminal care in a nursing home. While she is receiving terminal care, he sees to it that she is as comfortable as possible and functioning as fully as possible in terms of self-care and creativity.

During this time the social worker has helped Mrs. Jones with housing, financial resources, and counsel about what agencies can be of most help to her and how she can make best use of her resources. Here, too, a variety of services may be provided such as home care, occupational therapy, and counseling.

The clergyman and the church, too, have been on the job. They have been alert to make Mrs. Jones feel wanted, and have seen that she has the maximum opportunity to participate in the full life of the church, including worship, study to keep her mind alert, recreation, and service to others. So she not only feels that she is wanted, but also that she belongs to a significant group, and that she is rendering a significant service to society. She is helped to interpret the aging process and to understand limitations as contributive to rather than destructive of personal values. When she is ill and confined to her home, to the hospital, or the nursing home, the ministrations of the church are brought to her. The clergyman and other people call to give understanding, support, and companionship. They also render real help in the form of gifts and services of many kinds. The sacraments symbolize and channel in the deepest terms her dynamic relationship to ultimate reality and values. It is easier for her to accept the losses of aging, to experience illness and surgery, and finally to face the approach of death when some one who represents God himself goes with her and stands by her so that she does not feel alone, insignificant, or worthless.

But these various persons do not work in isolation. There has been consultation between them about Mrs. Jones and they have planned jointly for the most effective approach and relationship to her. More than that, Mrs. Jones herself has been on the team, so that all of them working together face her problem. Neither have they always stayed within the confines of a single role in relation to Mrs. Jones. Sometimes the physician has been the most effective force in physical recovery by what he does to help Mrs. Jones to face forward with hope, desirous of recovering, freed from any sense of guilt, reconciled to life, and to her fellow men. It may be that the social worker has been able to gain rapport when neither the physician or the clergyman could.

Beyond all this, the physician, clergyman, and social worker have worked together as community leaders to interpret the needs of persons like Mrs. Jones to the community, and to secure the kinds of resources that she needs.

*Gradual Retirement**

Sheldon F. Dudley, F.R.S.

A WISE SOLUTION to the problem of preservation of the health of the aged, especially their mental health, is the utilization of their limited productive capacity. Older persons should be given duties commensurate with their physical and mental faculties, rather than a dole or an unearned pension. There is sound economic reason for this, since a state cannot progress if a sizable and ever-growing segment of its population is non-productive.

The British Royal Navy set a precedent in World War II in placing older high ranking personnel in junior berths with marked success. Manpower was used effectively, and the advance of younger men was not stultified. The beneficial results of this experiment might well be studied by those concerned with retirement problems. The solution seems to be gradual demotion to positions of lesser responsibility.

*Gerontology or The Problems of Old Age. J. Roy. Nav. M. Serv. 36:111-124, 1950.

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